

## Che Cechnique of Inlay Making by the Direct and Indirect Method.

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#### VI

If it be true that the indirect method is preferable to the direct for porcelain fillings, it would seem that it must be of equal advantage in the cast gold inlay process. It is hard to understand why so many claim satisfactory results with porcelain and at the same time decry the method for gold. If an accurate reproduction of the tooth cavity is possible in the one case, why not in the other? I can hardly appreciate the difference, other than in favor of the latter.

Models Not Reliable for Obtaining Occlusion. The technique which I have adopted seems a sure check to failure in the indirect method. Some of my early efforts in the indirect method proved a failure, because I utilized the indirect method for the entire operation. By this I mean, that I took an

impression from which a die was made; a wax bite was obtained; the amalgam die was then placed in the bite and this mounted on a crown articulator, which arrangement was relied upon to secure an adaptation to the cavity and also to obtain the occlusion, and, of course, the results were far from satisfactory. First, because it is almost if not quite impossible to place the die in the wax bite accurately. Second, the move-



ments of such an articulator are not natural nor ever similar to the movements of the human mandible. Third, the plaster surfaces of the teeth representing those opposing the wax filling are far from accurate and not to be relied upon. Fourth, there are no means of proving the accuracy of the filling when placed in position in the tooth cavity. This is the proceedure of a great many of those who attempt the indirect method and, of course, the results are usually a failure and a condemnation of the whole system, principally because a faulty occlusion.

## Occlusion More Important Chan Adaptation.

In selecting the least of two evils, I would prefer a perfect occlusion and faulty adaptation to the cavity margin, rather than perfect adaptation to the cavity margin and faulty occlusion, because an imperfection in the margin will result in nothing worse

than a recurrence of caries at the point of defect, the same being easily detected and remedied before serious damage has been done. On the other hand, a faulty occlusion is dangerous in several, if not many ways, such as overcondensation of the gold at one or more points, causing fracture of a part, if not the entire wall, or as I have seen in several cases, the splitting of the tooth to the bifurcation. Even these are not so important as the dangers of producing pyorrhea and later a general malocclusion. In the event of either or both of the latter results, the patient suffers the infliction of an artificial denture, or, worse still, must go toothless to the grave.

# Cest of Accuracy of Direct Method.

The question then arises, can the dangers and difficulties in the direct method be overcome? Personally, I think they can. Again, is there anything to be gained in the elimination of these serious defects, by adopting the direct over the indirect

method? I sincerely believe there is.

By adopting the direct method as described below, a check is put upon both these very serious and probable defects, sometimes one and sometimes the other and very often both, which is more than can be assured in the direct method. The best proof is to try the following and note results. First, prepare the amalgam die as for the porcelain filling and in addition trim from the die all the overhanging surplus with a Hall's abrasive wheel on the laboratory lathe, being careful not to deface the cavity margin, and to shape it as near the natural form as possible, which requires but a few minutes time. Second, prepare the Taggart inlay wax as for the direct method: force it into the cavity of the tooth (not the die) with the same care and pressure which is observed in the direct method; have the patient bite into it and move the



mandible as in the act of mastication; chill the wax, trim the surface, shaping the filling as in the direct, other than upon the occlusal surface, which is best accomplished after the wax is placed in the die and very much more easily than is possible in the tooth cavity. Then if the die is an accurate reproduction of the cavity, the wax filling will go to place in it without difficulty, and will be found to fit, except, perhaps, at the cervix, where patterns are sometimes defective, varying in proportion to the size and complications.

The cause for defects at this particular point is simple enough. The wax when warmed to a suitable flexibility has resistance enough to force the gum tissue from the margins of the cavity at the cervix, but not enough stiffness to resist the effort of the gum tissues to return to their normal position before the wax is chilled. The result is a gradual pulling or dragging of the wax at that point, causing the defect pointed out. With the wax filling in position in the die you have exactly the same surfaces to guide in the carving of the occlusal surface as is present in the tooth cavity. In addition you have the very great advantage of being able to get at and see that the occlusal planes are not destroyed and can be accurately shaped, and the natural sulci can be reproduced without difficulty. The defect at the cervix, if present, can then be corrected by melting a little of the wax into place with a thin hot spatula.

The above, suggested as a test of the obstacles to be met in the direct method, likewise describes my method of obtaining the occlusion when using the indirect. The so-called "bite" is taken in the mouth with Taggart wax and when transferred to the amalgam die, is carved up to form the inlay pattern.

The finishing and polishing of the wax filling is best accomplished as described in the first chapter of these articles, see page 15, January, 1913, issue of the ITEMS OF INTEREST.

Completing the Inlay.

The sprue wire should be placed in position while the wax filling is still in the die to prevent possible defacement of the margins in handling. The sprue should be located at the point of greatest

bulk in the wax and as far from all the margins as possible. A very small sprue should be used, and for the smaller fillings, I find it best to fill the hole in the Taggart crucible former with bee's wax and use for the sprue a common pin, cutting off the head. The filling can then be removed without handling, and invested in the Taggart investing material as per directions furnished by him with each can. After burning out the wax the mold should be allowed to get perfectly cold before casting, to obtain the very best results.



First Gold Recommended for Casting. It had been my experience that new gold should be used for each casting. Gold that has been used more than once looses color and texture, becoming harsh and granular in proportion to the number of times it has been remelted. And so far as I know,

all attempts to clarify or refine the surplus from the casting by the operator himself amounts to little if any good and costs fully as much in the end as when sent to an assayer. The only possible disadvantage in this procedure is the necessity of carrying a large stock of gold, so that there may be enough to make it worth the assayer's while to refine it.

After casting, the filling should be washed and scrubbed with a stiff brush, then heated to a dull red and dipped in a 25 per cent. solution of sulphuric acid. The button or surplus should then be removed and the filling placed in hydrofluoric acid for two or more hours. It is then removed and placed in the die for polishing, which can be accomplished without danger of injury to the margins.

Use of Crays in Che Direct Method.

In the few cases where I find it advisable to resort to the direct method I have obtained the best results by making a cup or tray as for taking an impression with compound. This tray is then filled with the Taggart wax, forced into position and

chilled, then the tray can be removed, leaving the wax in the cavity. The upper or grinding surface can be softened with a warm air syringe so that the patient can bite into the same for occlusion. This prevents the possible chance of pulling away at the cervix as before mentioned and in my experience has been a time saver.

# "The Passing of the Gold Foil Filling." H Reply to the Eritique Presented by Dr. E. Edmund Kells.

By Rodrigues Ottolengui, New York.

In the October issue of ITEMS OF INTEREST there appeared a communication from Dr. C. Edmund Kells, which was welcomed because it opened a discussion upon a question of vast importance. The prime duty of dentists is the treatment of carious teeth by the insertion of some sort of filling, and that this should be done in the most scientific manner and with the broadest knowledge of the needs of the patient is so manifest that we need not discuss it.



In the paper by Dr. J. Lowe Young, and in the discussion and editorial by myself, to which Dr. Kells has taken exception, a plea was made for a closer study and a more accurate reproduction of tooth forms than has hitherto been prevalent, and surely this is a proper appeal. Yet Dr. Kells has seemingly misapprehended some of the views expressed and consequently antagonizes these papers as he has understood them.

Let me consider Dr. Kells's arguments seriatim. In his opening he says:









Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

"One would be led to infer from the opening paragraph quoted above, that the idea of reproducing natural occlusal surfaces was being introduced generally to the dental profession by Dr. Young at this late day, though in some desultory cases (including some of Dr. Taggart's own work in casting) it is admitted that it had been attempted since that casting process came in vogue.

"This is not, however, a fact, for in 1888 Dr. J. Rollo Knapp, of New Orleans, did originate and introduce to the dental world, and for the first time show to hundreds of dentists at many meetings, perfect restorations of occlusal surfaces in his crown and bridgework. Just such restorations as Drs. Young and Hyatt show on pages 362, 372 and 373, May Items of Interest, were also made by the writer in 1888 after seeing Dr. Knapp's work, and are shown in Figs. 1, 2, 3, and 4, and undoubtedly the same class of work must have been copied from Dr. Knapp by many others."

Gold Crowns in the Past.

I had the pleasure of hearing Dr. Young's paper when it was presented, and have read it again since receiving the communication from Dr. Kells, and I can find nothing in it to warrant the notion that

Dr. Young was harboring the idea that no one before him had advocated the reproduction of occlusal surfaces. Having ascribed this claim to Dr. Young, my very good friend Dr. Kells then tells us that Dr. Rollo Knapp had reproduced occlusal surfaces in crown and bridgework, and



he speaks of these as having been "perfect restorations." Dr. Kells then exhibits similar work done by himself.

In replying to this I am no more critical of the beautiful work forwarded to me by Dr. Kells, and illustrated in Figs. 1, 2, 3, and 4, than I am of the work of all the other dentists in the world, when I state that even these specimens, beautiful as they are, fall far below the standards for which Dr. Young made his appeal, and which should be ever present in the mind and finger-craft of the dentist. I have not seen specimens



Fig. 5

of Dr. Knapp's work, and therefore cannot speak of its excellence or short-comings, but I will say this: I have never seen any shell gold crown from the hands of any dentist in the world that could compare in accuracy of reproduction of occlusal surfaces, with similar work made by the casting process. Indeed, as crowns are commonly made by dentists, and with the dies used by them, it is, in my opinion, impossible. Perhaps more correct forms might be made from steel dies, but such ready-made crowns as are thus produced do not seem to be much better than those constructed by skilled dentists, such as Drs. Kells and Knapp. I may say that the stamped gold crown compares with the cast gold crown as an impressionist painting compares with the work of a realist. It may resemble nature, but it is woefully lacking in detail.

Let me be more explicit. All shell crowns that I have ever seen, including those offered by Dr. Kells, while pretending to present cusp formation, do not at all closely imitate the sulci, grooves and other lines commonly found in the occlusal surfaces of molars and bicuspids. In a future communication I hope to be able to go into this subject deeply, but for the present suffice it to say that in shell crowns we find the depressions between the cusps rounding at their bottom most parts (see Figs. 1, 2, 3, and 4), whereas they should be sharply angular, as seen in Fig. 5 (Fig. 36 of Young). This is an essential factor in the usefulness of the tooth as a masticating organ, and any departure therefrom in an artificial substitute, whether crown or inlay, causes a proportionate lessening of functional service.



This is a part of Dr. Young's plea which seems to have been overlooked by my esteemed confrère, though in his defense I desire to say that the difficulty of reproducing Dr. Young's specimens in printer's ink is so great that it is impossible to convey the same impression with pictures as would be acquired from the specimens, and I feel sure that if Dr. Kells could see the castings presented by Dr. Young and the practical work now being done by a number of dentists in this vicinity, he would believe with the rest of us that Dr. Young did not write in vain.



Fig. 6.

There is another point, however, and that is that when Dr. Kells shows us shell gold crowns to prove that Dr. Young's idea is not new, he is quite aside from the argument, because Dr. Young was not discussing crowns at all, but cast gold inlays, and the entire gist of his argument was, that whereas there might have been some excuse for dentists who filled teeth wild gold foil in such a manner as to fill up the sulci and shorten the cusps, thus producing flat tops to teeth, now that we may do our carving in the plastic wax, and then reproduce the same in metal by casting a better standard of occlusal restoration when using inlays, becomes imperative. And this is timely, because even to-day it is safe to premise that over eighty per cent. of inlay makers are filling teeth in such a manner that the masticating function is lessened rather than restored.

Restorations with Porcelain.

Further along Dr. Kells says: "When porcelain was introduced an opportunity was given for the development of the *artistic* in the operator, and most beautiful and natural restorations of the occlusal

surfaces were the order of the day."



This is an astonishing statement. If these wonderful porcelain restorations have been so common, I would esteem it a great favor if my friend would send me a specimen. Does he really mean that he has seen porcelain occlusal restorations which have copied Nature with anything like accuracy? Is it not a fact that Dr. Leon Williams and a host of others for twice twenty years have been scolding the tooth manufacturers because of their failure to reproduce occlusal surfaces? Again it

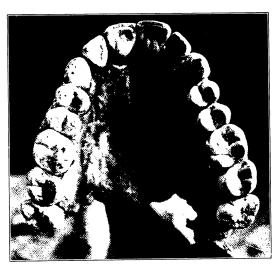


Fig. 7.

seems to be a question of standards. I believe it to be more impossible to copy Nature accurately in porcelain than in a stamped crown, whereas the possibility of making such a duplication by casting is only limited by the skill of the dentist.

Let us make this so clear as to be beyond dispute. Let us take a typically perfect molar tooth, and from it obtain an absolutely accurate impression. Can we not press wax into this impression, making a casting from this wax pattern and obtain a gold replica of the original which will be accurate to the finest visible line? Can a similar reproduction be made in a stamped gold crown or in porcelain? If so, I should indeed be grateful to the one that demonstrates the possibility.

This, then, is the plea. Taggart has given us a process by which we may copy teeth, as we never have been able to do before. Several years have passed, and the vast majority are not even trying to make better occlusal surfaces than we made with foil. Hence the communication from Dr. Young.



Dr. Kells offers an argument against the restoration of occlusal surfaces, from which the following extracts are clipped:

The Form of Ceeth in Old Age.

"While I dislike to differ with the editor, I believe this paper in question will not even cause a ripple upon the surface of general practice, and for the following reasons: Normal occlusal surfaces of the teeth of a hale and hearty man of sixty with

a good denture, are not what they were when he was twenty. The



Fig. 8.

cusps have worn down and the sulci shallowed, and for a reason. At twenty his teeth were much stronger and tougher and less brittle than at sixty, and the fact that there is no longer any such deep interlocking of the cusps at the later age saves many a good tooth from being split."

As to the "ripple" which this paper might make, it may surprise Dr. Kells to learn that it has already caused a "ripple" so large that it has spread across the Atlantic, the paper having been copied into several foreign languages. At home and in Canada there is abundant evidence that Dr. Young has attracted a great deal of attention, and that hundreds of men throughout the country are doing better work because they are now attempting to produce better occlusal surfaces with inlays than they have heretofore made either with filling or inlay.

Dr. Kells tells us that the teeth of a man of sixty differs from what they were at twenty. Assuredly, but no one advises that all molar oc-



clusal inlays should be identical in shape regardless of age. It is true that cusps wear down (see Figs. 6, 7, and 8), but it is also true that the sulci persist to the very last (see Fig. 8), whereas in the hands of the average dentist the sulci are obliterated at once, with filling or inlay.

Creatment of Ceeth Abraded by Use. "Elsewhere Dr. Kells shows us 'an old soldier' (Fig. 9) which, judging from the manner in which its enamel has worn away was in 'normal occlusion' with its opponents, and the soft gold foil filling probably served the 'limit of its usefulness' by saving it

from decay for many a good old year."







Fig. 10.

This "old soldier" comes within the scope of my last assertion. All the cusps have been lost, by attrition or erosion, or both, yet a part of the sulcus persisted, and some dentist destroyed the last vestige of usefulness by filling that up flush with gold, thus removing the last food-holding depression. I cannot agree with Dr. Kells that "the soft gold filling served the limit of usefulness," even if it were placed there half a century ago, because the "limit of usefulness" in a filling does not reside in the mere fact that it prevents recurrence of decay; it should likewise restore masticatory form. The flat filling in the "old soldier" not only prevented the recurrence of decay, but it likewise prevented the fullest usefulness of the tooth, and if it did that for fifty years, the greater was the damage done to the patient.

This may seem extreme argument, but it is not. It has been claimed that experts can examine human feces and determine that the subject either *did not* properly masticate his food, or else had suffered the loss of one or more molar teeth, and thus *could not* properly masticate his food. This, I think, has been indubitably proven. It is conceivable, therefore, that mastication performed with teeth, whose cusps have been materially shortened by flat or malformed inlays or fillings, would be quite as inadequate and as discoverable by examination of feces as where a molar tooth had been lost.



Returning to our "old soldier," should we leave him without a crutch merely because we find him crippled with age? Let us see what a cast gold inlay will do for the old fellow. If we study him closely, we note that the distal border has disappeared and that we have an incline plane where we should have a protecting cusp. Logically, we look for caries at the distal approximal contact point, and, of course, we find it. I have taken the liberty, therefore, of fitting up this "old soldier" with an inlay (Fig. 10), making room for it by removing that wonderful soft gold filling which has been interfering with mastication so long and also cutting out the distal caries. Look at him with his new "wooden leg!" Will he not "step livelier?" Observe that, without elevating the occlusal plane



Fig. 11.

to what it was at twenty, but conforming with the limitations of the environment and age, yet I have made a restoration which renders the tooth a better masticator; and by supplying a protecting distal cusp, and a groove for carrying food buccally and lingually away from the contact point, I not only lessen the chance of recurrence of caries at the distal surface of the "old soldier," but at the same time I protect his neighbor from danger of occurrence of caries at the mesial contact point.

And this is the meaning of the new art of filling teeth. We must not alone preserve from recurrence of caries, but we must restore to normal form, and normal form means that form which is normal in the individual at the time of treatment, though, as with the old soldier, we may be excused if we supply him with something better than the environment. This is not a fresh idea, for in the discussion of Dr. Young's



paper I said much the same thing, though it seems to have escaped my confrère and critic.

Let me quote the paragraph here for the benefit of those who may have missed the former article. In the discussion I said:

"In the next illustration (Fig. 11) I show you an inlay in a second lower molar. It will be noted that the lingual cusps of the bicuspids and first molar are much worn away by attrition, following which the dentine has become typically cupped out in the cusps of the first molar. In carving an inlay for the second molar, which was done in the mouth, I used the first molar as a pattern and copied it. I flattened off the buccal cusps to reduce these to the same occlusal plane as its neighbor, and I copied the cupped-shaped depressions of the first molar because in this manner this part of the tooth would serve better for masticating purposes. I did this, also, as a means of accentuating in this discussion the fact that when dealing with mouths where the normal tooth form has been partially destroyed by attrition, it is not advisable in carving an inlay to attempt to make the tooth, when restored, assume the form that it had when first erupted. The tooth should better be restored to that form which it would have had, had it not been attacked by caries, and this may be learned by a study of the sound teeth in the same mouth, and especially of its fellow if it happen to be present.

"Such study of abraded or partly worn teeth will prove, as Dr. Young has said, that it is the high points of the cusps that are worn away, and thus depressions may be lessened, but this will not matter, since necessarily the height of the antagonizing cusp of the opposing tooth must have been proportionately lowered. But the sulci will always be present, and these greatly aid in the proper trituration and escape of food, and

hence should be reproduced in the inlay."

Che New Art in Relation to Prophylaxis.

And further on Dr. Kells quotes from me and criticizes me for saying that with the older methods of filling teeth, and especially with soft foil, "saving teeth was about the limit of its usefulness," and then he adds that according to his understanding the sav-

ing of teeth has been the principal object of dentistry. This is true, and hence the necessity for an awakening of the Rip Van Winkles of dentistry. The future duty of dentists will be not only to save teeth, but likewise to restore them to the limits of usefulness, and this is entirely in accord with the great prophylactic movement with which Dr. Kells fears we may be at variance. Are we not teaching the people that salvation of their teeth means salvation of health and lengthening of life? If, then, the people come to us with carious teeth, and perhaps already suffering from gastric and digestive ailments due to faulty teeth, should it not be our duty when repairing the ravages to restore normal function as well? Surely! And be assured that the future measure of skill in dentistry will be closely related to the excellence of tooth restoration, and tooth salvation will be but a fundamental requirement.



As an example of the difference between merely saving teeth and really restoring them in accordance with the new school of "occlusionists" I introduce Figs 12 and 13. In Fig. 12 we see two lower bicuspids "saved" with gold inlays, and two molars "saved" with amalgam, which latter has so many defenders in the land. I say "saved" because there was no caries present. But note the flat inclined surfaces of the inlays, and the shapeless form and lack of approximal contact in the amalgam filling.

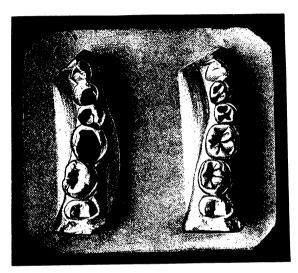


Fig. 12.

Fig. 13.

Is it any wonder that the patient declared that she "eat on the opposite side of mouth?" In Fig. 13 we see the same teeth after restoration with cast gold inlays. Was I not justified in refilling these teeth, even though their salvation was not yet at stake? I think so. And it is because of this possibility with cast gold inlays that I wrote the editorial entitled the "Passing of the Gold Foil Filling." But I did not mean and never have publicly expressed the belief that gold foil should or ever will be abandoned. But it must give way to the inlay in large restorations, because work that can be easily done with the inlay cannot be duplicated with gold foil, just as a gold shell crown cannot be made as good a copy of natural form as one which is cast.

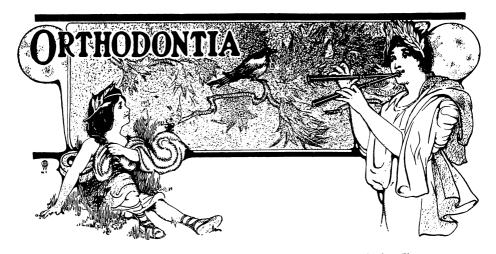
Dr. Kells asks me what of the great prophylactic movement, if "the anticipated revolution in the art of filling teeth takes place?" Undoubtedly, if all school children could have dental inspection, and if there were



dental nurses so busily cleaning teeth that caries would be detected as soon as the sulcus or contact point were attacked, and if we had dentists enough in public clinics to do the needed reparative work at the moment of discovery, then, indeed, could we depend exclusively upon the gold foil which has served us so faithfully and so well. Then, indeed, could we not only cast aside our cast gold inlays, but we could also deposit our "china fillings" in the china closet with other curios.

But with statisticians telling us that there are about fifty million carious teeth in children's mouths at the present time, this millennium is some distance ahead of us, and for many years to come we must be prepared not only to save teeth by filling them, but to restore them to as near normal as skill can be taught to accomplish, and this great work must be done with the cast gold inlay. Let us then take up the task and learn how.





## The Technique of the Practical Application of the New Angle Appliance.

By J. Lowe Young, New York City.

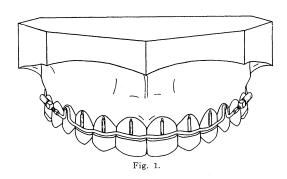
Read before the American Society of Orthodontists, Chicago, July, 1913.

In August, 1910, I spent several days with the wizard of Orthodontia, Dr. Edward H. Angle, learning as best I could from him the application, the fine technique and the possibilities of these wonderful appliances which we have under discussion to-day, as he had worked them out in his mind and on plaster casts. At this time, you must understand, they had not been tried out on practical cases for sufficient length of time to determine their efficiency. I at once began to use them and from that time I have applied them to every case that has come under my care, with one exception. A twelve month subsequent to August. 1910, I had removed all other forms of appliances from my cases except the most simple retainers, and had substituted this form of appliance.

Now, after three years' experience in which I have applied them to all kinds of cases, I come before you with this essay, imperfect no doubt in many particulars, but with the hope that you may be benefited by my description of their application; for, as no two men work exactly alike, neither do they write nor describe things exactly alike. Gentlemen, I wish to say to you at the beginning in all seriousness, that, if for any reason, I were deprived of these delicate appliances I believe that I should give up the practice of orthodontia.



It is fair to assume that every orthodontist has carefully read and re-read the articles published by Dr. Edward H. Angle, in which he describes his new orthodontic appliances. The first of these articles appeared in the *Dental Cosmos* for March, 1910, under the title "Bone Growing"; the second, in the *Dental Cosmos* for August, 1912, under the title "Evolution of Orthodontia—Recent Developments," and the third, in the Dental Cosmos for January, 1913, "Further Steps in the Progress of Orthodontia." As it would, therefore, be a waste of your time for me to quote from these articles I will try to confine myself to a



description of the practical application of these appliances from my standpoint.

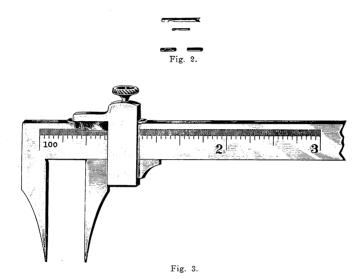
I wish to impress upon you the fact that a great step has been made in orthodontia appliances and also the necessity for accuracy in the use of these appliances in order to obtain their greatest efficiency. When we consider that the parts used in their construction are measured by thousandths of an inch it must be obvious to everyone that accuracy is of the utmost importance if we hope to be successful in their use. And here let me say that it is time we, as orthodontists, accept the micrometer as the measuring instrument in orthodontia, and lay aside the gauge which is now obsolete among all real mechanicians. I will, therefore, try to describe each step in the construction, application and adjustment of these wonderful appliances as I have used them in the treatment of practical cases.

Construction of Bands and Cubes.

In Fig. 1 you will observe bands on the six anterior teeth, with their seams on the lingual side, and so formed that the gingival border of the band passes beneath the free margin of the gum on the labial side. This necessitates that these bands be



festooned on their approximal aspects. Bands so placed can be of sufficient width and yet be to the gingival of the point of contact, which is important where so many bands have to be used. I wish further to call your attention to the fact that these bands are of sufficient width so that the end of the pin that projects through the tube does not reach beyond the margin of the band, and also that the middle arch section to



which these pins are soldered, rests on the band and not on the exposed enamel of the tooth. If these tubes or pins are allowed to extend beyond the margin of the bands they prevent the proper cleansing of the parts, which is a very serious objection in view of the fact that patients wearing these appliances are seldom seen more than once a month, and often at longer intervals.

Iridio-platinum, three thousandths of an inch in thickness, and of proper width, I have found most suitable for making these bands. Before attempting to shape the band in the usual way, the side of the band material that comes in contact with the tooth is roughened by drawing it over a round cross-cut file No. 3 cut. The object of this roughening is to secure a firmer attachment for the cement so that the bands are not loosened while inserting and removing the pins.

In the beginning of a case, as shown in this figure, the band for the left central is made first and the tube (Fig. 2) is soldered to the labial surface so that it will lie over the median line of the tooth when the



band is forced to place. The only exception I make to so placing the labial tubes is where the lower incisors and cuspids, and occasionally a very narrow upper lateral, need to be rotated and then the tube is placed either side of the median line, according to the requirements of the desired movement. The tube of this band, which must be accurately fitted, is used as a starting point to determine the position in which the other tubes are to be placed.

The right central band is next fitted and the position of its tube determined as follows: The fixed beak of a calipers, shown in Fig. 3, is placed in contact with the tube on the left central band, the other



Fig. 4.



Fig. 5.

beak is moved to the position it is desired to place the tube, and the band marked by means of a suitable lancet, using the movable beak of the calipers as a guide. The tube is soldered directly over this mark. At first this was not an easy thing to do, but by means of the solder staple (Fig. 4), described by Dr. Angle in the Dental Cosmos for January, 1913, it is a most simple matter to place these tubes exactly over the scratch on the band. Where the bands and tubes are of iridioplatinum these solder staples should be made of pure gold, for it has been noted that gold solder even 22K is not suitable to join iridio-platinum parts. In this delicate work the least quantity of solder should be used and pure gold makes a union that is far more secure and which will not oxidize. It is important that these tubes should be in the proper position inciso-gingivally, according to the requirements of the case. In like manner the remaining bands are made and the tubes attached so that they will be parallel when the bands are cemented in place. Failure to have these tubes so placed is almost sure to discourage a beginner in the use of this delicate appliance.



Precaution in Cementing Bands.

In cementing these bands care must be exerted to prevent any of the cement entering the labial tubes. Various methods have been used to obviate this, but the one found most successful is to stop up both ends of the tube with bees-wax before placing

the cement in the band. The bands should be cemented individually so as to make sure that each is thoroughly cemented and accurately burnished on the lingual surface of the tooth. The cement must be allowed

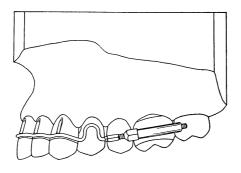


Fig. 6.

sufficient time to thoroughly set before attempting to insert the pin in the labial tube.

Anchor Bands.

D bands are now fitted to the teeth that are to be used as an anchorage (usually the first permanent moiars). In cases where it is found necessary that these anchor teeth should be moved buccally to any

great degree it is advisable that the buccal tube of the non-rotatable variety should be used (Fig. 5). In adjusting these buccal tubes it is even more essential that they be properly placed, than where the ordinary expansion arch is used. The mesial end of the tube should be in such a relation to the band as to allow the nut on the screw section to occupy the buccal, embrasure between the anchor tooth and the tooth mesial to it, as in Fig. 6.

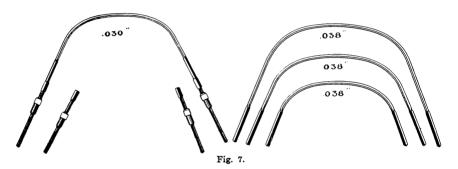
The direction of the tube, with very few exceptions, should be such as to cause the arch when placed in the tubes to lie very close to, if not in contact with, the buccal surfaces of the teeth mesial to the anchor tooth. The direction of the tube on each band should so harmonize that when one end of the arch is inserted into the tube that is to receive it,



the other end of the arch will lie on the same plane from both a vertical and horizontal view, with the tube of the opposite side. In order to do this in the mouth a regular expansion arch should be used as described in a previous article by the writer, read before this society and published in ITEMS OF INTEREST for February, 1912.

Construction of Middle Section.

After these bands are securely cemented in place the case is ready for the construction of the appliance, which should always be done in the mouth. In doing this I would suggest that the operator develop a definite system, beginning, for



example, always on the left side of the mouth. One of the screw sections of the arch is placed in the buccal tube on the left molar band and enough of the thread should be exposed between the nut and the square portion, so that the nut can be turned back to liberate the square end of the middle section of the arch, for it is obvious that when the pins which are soldered to the middle section of the arch, are telescoped into the tubes on the bands on the anterior teeth it is impossible to draw this middle section forward to remove it from the screw section.

The length of this middle section should be determined as described by Dr. Angle in his article published in the *Dental Cosmos* for August, 1912, namely, by bending a piece of the heaviest brass ligature wire to the shape you wish to make the middle section, and also so that it will assume the position you desire the middle section to occupy when finished. The wire is then straightened and afterward curved to correspond in shape to the middle section of the arch. This is found to be a reliable gauge for the length of the middle section. These middle sections can be procured in three sizes, namely, .030, .038 and .045 of an inch and also in three lengths as shown in Fig. 7. They are also made in nickle, silver and precious metal. And just here I wish to say that these precious metal middle sections are made of an alloy far superior to any-



thing I have ever used before. In fact, it seems to be ideal and to meet every requirement.

In constructing the appliance which we are considering to-day, the middle sections of precious metal .030 of an inch in diameter is always used. If possible, a middle section should be selected of sufficient length to allow all of the square portion to be cut away with the exception of enough to just telescope into the square hole in the screw section. It should also be long enough so that a loop may be bent on each side

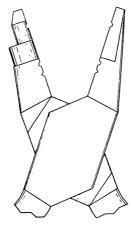


Fig. 8.

just anterior to the square portion of the arch. The reason for this will be given later. The selected middle section should be heated to a cherry red and quickly plunged into water to soften and at the same time oxidize the metal.

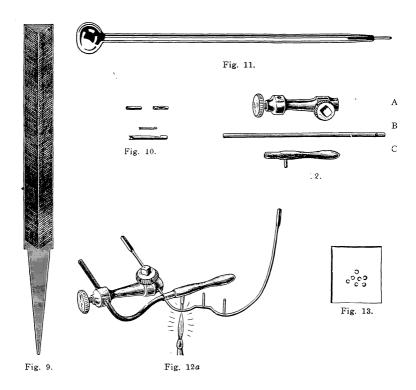
The left end of the middle section is now placed in the square socket of the screw section which has been previously placed in the buccal tube on the left side, and where the non-rotatable variety of buccal tube is used, it will frequently be found necessary to twist this middle section so that the arch will lie in its proper position on the opposite side of the mouth.

To do this and other bending necessary to construct this appliance, I have devised and had made pliers as shown in Fig. 8. Across each beak of these wire bending pliers you will notice three grooves which should be opposite each other, so that when the jaws are closed they form two round holes and one square hole. The object of these grooves

821 **noo**,



is to get a more firm grasp on the wire so as to twist it and to prevent bruising it. The square end of the middle section is grasped in the grooves nearest the handle of the pliers and the round portion is grasped with another pair of pliers, using the grooves nearest the ends



of the beaks. With a little practice the wire can be twisted on itself just the desired amount with practically no danger of fracturing it.

To bend the loop referred to above, the wire is grasped in the grooves nearest the ends of the beaks just in front of the square portion and bent at a right angle over the round beak of the pliers. The pliers are now turned once over, placing the round beak on the opposite side and the wire grasped, not in the groove, but on the round portion of the second step and bent so as to form a U. The pliers are turned over once more and the wire grasped in the grooves nearest the beak and again bent at right angles over the round beak as before, thus finishing



the loop. The closed portion of the loop should always present toward the gingiva.

The middle section is now returned to the mouth and the left end inserted in the square socket of the screw section as far as it will go and the relation which the wire bears to the buccal surface of the teeth is carefully noted. When passive this wire should lie close to these teeth. With a suitable lnncet (No. 4 S. S. White) the wire is marked opposite the distal surface of the cuspid, the middle section removed, and the wire bent so that it will conform to as much of the labial surface of the cuspid tooth as possible. The middle section is again returned to the mouth as before and with this same lancet the wire is marked in the median line of the labial tube. This scratch is readily seen when the wire has been oxidized. When I first began using this wire I found I could make it less springy by dropping it in wood alcohol after heating it, but as this removed the oxidation from the metal and made it very difficult to find this delicate mark I have entirely abandoned this method of annealing.

Methods of Soldering the Upright Pins.

After marking the wire the middle section is removed and with a fine screw-head file (Fig. 9) a delicate nick is cut in the wire to determine the point at which the pin is to be soldered. The position of this nick is determined by the scratch made

on the labial surface of the wire with the lancet.

You will recall that Dr. Angle has described two distinct methods of soldering these pins to the middle section of the arch. The first one is to place the pin (Fig. 10) in a suitable pin-holder (Fig. 11) so that it is held in one hand and the middle section to which it is soldered is held in the other hand. The other method is to use a soldering jig (Figs. 12 and 12a) which I am convinced will be found far more accurate, especially for beginners. When we consider the delicate attachment of these pins which are only .022 of an inch in diameter we must be impressed that the heart beat might be sufficient to prevent the accurate soldering of them when a part is held in each hand. By means of this instrument it is possible for any painstaking operator to accurately solder these pins.

Owing to the difficulty of properly placing such delicate pieces of solder Dr. Angle devised a very ingenious method as shown in Fig. 13. I have tried to improve on this a little by having my laboratory man place these rings on the pins and slightly fuse so as to attach the ring to the pin in advance. I hope that these pins will soon be supplied with the solder so attached. I will not attempt here to describe the use of the jig, but will leave that for my clinic.



Before attempting to insert the pin in the tube that is to receive it, the tube should be freed by passing a twist drill .022 in diameter through it, for the fit of the pin is so accurate that the least particle of cement or the slightest bur on the inside of the tube will prevent the pin from entering properly. For cleaning out the tubes on the lower teeth I have found it necessary to use a drill with a very short handle, as shown in Fig. 14. Next, the incisal opening of the tubes should be reamed out with the instrument devised by Dr. Angle for this purpose (Fig. 15).

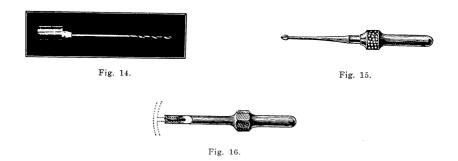




Fig. 17.

The pin is now inserted in the tube that is to receive it and if the right quantity of solder has been used it should telescope into the tube sufficiently so that the catch on the pin locks on the gingival end of the tube; if it does not do so the excess solder should be removed by means of the solder trimmer (Fig. 16) devised by Dr. Angle, so that it will lock. The nut of the screw section is turned back to allow the square end of the middle section to pass in front of the hole in the screw section. The screw section is then pulled forward with a pliers so that it telescopes over the square end of the middle section thus holding the two parts together, and the wire marked to indicate the mesial surface of the cuspid. The screw section is then pushed back to liberate the square end of the middle section, the pin unlocked by means of the band adapter (Fig. 17) and the middle section again removed. The wire



is then bent so that it comes in contact with as much of the lateral incisor as possible and again returned to the mouth, the pin inserted and a mark made as before to indicate where the second pin is to be soldered. In case it is found that this pin is not on the same plane with its respective tube when the first pin is inserted in its tube, it is much better to put a twist in the base wire rather than to attempt to bend the delicate pin, which is liable to weaken it where it is soldered to the middle section. This twist is made with two pairs of pliers as previously described, except that the wire is grasped in the grooves nearest the ends of the beaks with both pliers.

The middle section is again returned to the mouth and both pins inserted so that they lock, and the relation of the square end to the opening in the screw section should be carefully noted. If not in proper position to permit the screw section to telescope over the square portion without any difficulty it should be bent so that this will be possible. In like manner the middle section should be made to conform to the labial surface of each banded tooth, bending the wire to fit but one tooth at a time, working from left to right, and reapplying it to the teeth each time a pin is soldered until all the required pins have been so placed that they will readily telescope through and lock in their respective tubes, and the middle section rest passively in position on the teeth.

The right side of the appliance is finished as described at the beginning for the left side and when done it will be found that the bends in the pins have been straightened out owing to the repeated passing and removing of them from the tubes with the metal in an annealed state. They should be rebent as nearly as possible to their original shape so that they will lock when passed through the labial tubes. The middle section is now heated to a cherry red (preferably in a closed muffle) and the appliance cooled in the air. This retempers the metal so that it is almost as springy as it was in the beginning. The oxidation is then removed and the appliance placed in the mouth.

If each step in the construction of this appliance has been carefully followed as described above it will be found that when the pins on the middle section are inserted in their respective tubes no inconvenience is experienced by the child. And this is as it should be.

The nut on the screw section should be turned up causing it to telescope over the square portion to its full extent.

Object of Ecops.

The main object of the loops in front of the square portion of the middle section is to give a constant pressure over a much longer period than is possible to obtain where the middle section is left

straight. They are also useful as a means of lengthening the middle



section by slightly straightening them from time to time so that the screw section does not move too far forward and thus render its bearing unstable in the buccal tube. In many cases where the dental arch must be lengthened to any great degree, the use of these loops will obviate the necessity of constructing a new middle section.

This appliance should be worn for a week without any attempt being made to induce tooth movement. In many cases the middle section can be left
for months without removal and the pressure ob-

tained by tightening the nuts on the screw section from time to time,

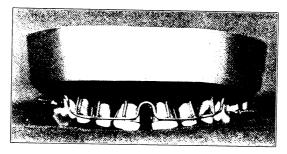


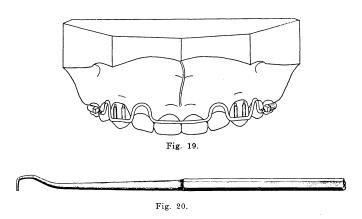
Fig. 18.

in the event of which you will be guided as you have been when turning up the nuts on the regular expansion arch, namely, by a snug feeling of the teeth. But in the majority of cases it becomes necessary to remove this middle section in order to straighten it somewhat to bring about various tooth movements.

Whenever the middle section is changed in shape it is advisable to make but one alteration at each visit of the patient, keeping the remaining portion of the appliance as a control. The part that has not been changed in shape is reapplied to the teeth, the pins inserted into the tubes so that they lock, the nuts on the screw section turned up to unite it with the middle section and the relation the remainder of the appliance bears to its respective tubes should be carefully noted. To be specific on this point: at no one time should the middle section of the appliance be straightened more than would change the relation of the pin with its tube the wall thickness of the tube. In rotating teeth it becomes necessary to accentuate the bends. In doing this the middle section should



be bent just sufficiently to cause the pin to lie on the labial side of the tube of the tooth to be rotated, when the base wire rests on the prominent portion of the tooth, working on but one tooth at a time. It is much safer to soften this middle section as described above before attempting to straighten the wire. If the second step of the pliers devised for this purpose is used to straighten these bends there is practically no danger of breaking the wire. In like manner the large, round step of the pliers is used when it is necessary to straighten the loop just anterior to the square portion of the middle section.



Modifications of Appliance.

In order to use this appliance on all kinds of cases it becomes necessary to modify it to meet the conditions. For example, when the roots of the central incisors converge and the crowns diverge a

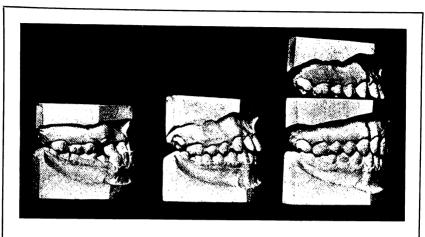
loop is made in the wire over the second step of the pliers midway between the points at which the pins that enter the tubes on these teeth are soldered. When a loop of this kind is used between two pins it is practical to have the labial tubes converge toward their gingival ends. The extent of this convergence on each tube should not be more than half of the outside diameter of the tube. This application is shown in Fig. 18.

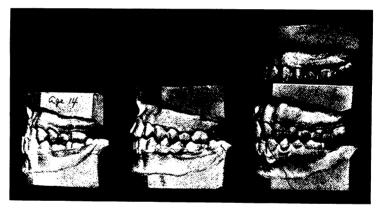
Creatment of Deciduous Ceeth.

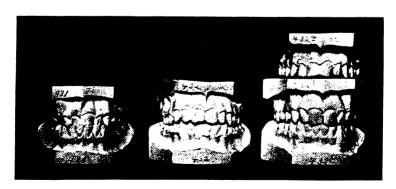
In the treatment of deciduous cases the cuspid teeth only are fitted with bands to which are attached labial tubes. Owing to the conical shape of these deciduous cuspids I have found it advisable to cut nicks in the enamel on both the labial and the lingual

surface to get a more firm attachment for the cement. In fact, wherever





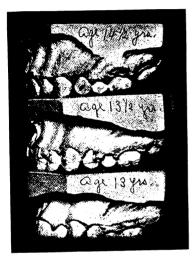




Figs. 21, 22 and 23.



I band deciduous teeth I nick the enamel with a very small knife-edge carborundum disc and since adopting this plan I have had very little trouble with bands coming off. Fig. 19 shows how the middle section of the arch is bent between the pins that enter the tubes on the deciduous cuspids. The appliance is removed once a month and one of these loops slightly straightened out and the apparatus reapplied. As the span from cuspid to cuspid is so long, considerable difficulty was encountered with these delicate pins breaking off.. To obviate this I have placed two



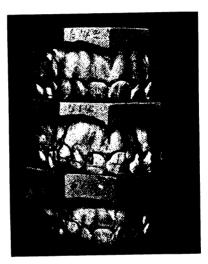


Fig. 24

Fig. 25.

tubes on each cuspid band and soldered two pins to telescope into them. In this way I have practically overcome the breaking of these delicate pins. To remove these broken pins from the tubes was very trouble-some until I devised an instrument shown in Fig. 20. Since then I have had no more trouble.

Creatment of Mixed Dentures.

In the treatment of mixed dentures we frequently have teeth erupting in torso-occlusion. Many of these will assume their proper position owing to the pressure of the tongue, which is allowed free play with this form of appliance, provided

the dental arch is widened sufficiently to accommodate them. Where this does not occur I have soldered to the middle section a piece of this same spring gold .022 and bent it so as to pass lingual to the erupting tooth and press on the portion of the tooth most lingual, with very gratifying results.



In order to carry the roots lingually, as is sometimes necessary in Class III cases, the pins should be soldered so that the notch presents lingually. In all other cases the notch on the pin should present labially.

When necessary to move several front teeth laterally it is best to

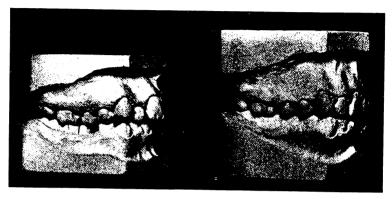


Fig. 26.



Fig. 27.

resolder the pins from time to time. For example, if the four incisors and one cuspid should be moved to the left, the left cuspid pin is moved to the left the wall thickness of the tube, the appliance reapplied and worn for at least two weeks. At the next sitting this same pin is resoldered, moving it the same as before. In this way all of the front teeth except the one that is being moved, act as an anchorage against this tooth. When in its proper position the next tooth is moved in a like manner and so on until all are placed as desired.

The Appliance as a Retainer.

When the teeth are in their proper positions this appliance serves as a retainer, provided it is worn in a passive state. If it is not so it should be removed and shaped so that when reapplied it will



rest passively on the teeth. You will recall that Dr. Angle originated this form of appliance to act as a "working retainer"; that is, to retain the crowns of the teeth as they were and at the same time move the roots in the desired direction. Where the entire treatment has been done by means of this appliance the roots and crowns are moved in unison.

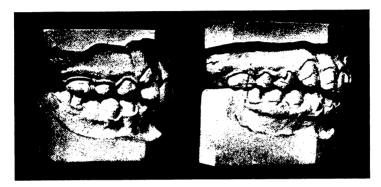


Fig. 28.

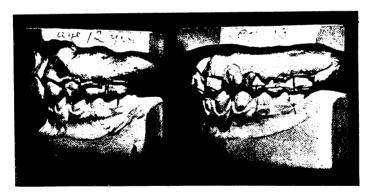


Fig. 29.

Especially do I wish to impress upon you that each beginner should thoroughly master the technique of these delicate appliances by repeated application of them to plaster casts or technique models, before attempting to place them on practical cases, and in doing this let me suggest that the bands be all securely cemented just as they would be in the mouth before the middle section is fitted. There are many new thoughts to master, and each step must be most painstakingly and accurately executed if you would employ them efficiently.





Fig. 30.

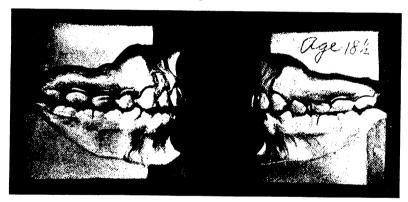


Fig. 31.



Fig. 32.



Remember that the highest kind of skill is purchased only by the most painstaking kind of work. Only by doing our work carefully and bravely can the purchase price be paid, and only by not traveling in the middle way of mechanics and thought can we know any great happiness in our work. Let the modern orthodontist learn early in his work that he must accept without whimpering a measure of sorrow in return for every moment of great advancement: it is inevitable. This lesson once learned will make his way easier and his work less bewildering.

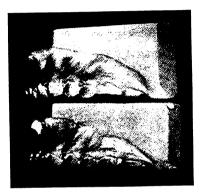


Fig. 33.

Cases from Practice.

Slides made from models of a few cases that have been treated with this form of appliance will now be shown. In all of these the models with odd numbers on them are the first to show the condition

of the case at the beginning of treatment, as "431." The next models after treatment are number "432" and the next ones "432a," and so on. In this it will be observed that an accurate record of the progress of the case is kept by the models alone.

Fig. 21 shows the profile view of the right side of models 431, 432, 432a and 432b.

Fig. 22 shows the profile view of the left side of these same models. Fig. 23 shows the front view of these same models.

This case was treated with the expansion arches and ligatures and when retained with the usual form of retainer was as shown in models 432. After about two years of retention, the roots of the upper teeth were found to have moved but little in response to the forces of occlusion and the retainer was removed from the upper and an impression taken and cast 432d was made. At this stage of the treatment, the new Angle appliance was installed and the case treated for two and a half years with the result as shown in models 432b.

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Figs. 24 and 25 show profile and front view of casts of upper, treated from the beginning with the new Angle appliance. Please notice the increase in width over the cuspid roots in cast 614a over that shown in 614.

Figs. 26 and 27 are right and left profile views of a case treated by this same form of appliance. In this case the active treatment extended over one year and the appliance was left another year as a retainer. The appliances were removed with the result shown in models 718. Please note the increase in length of the dental arches without tipping the teeth. The lower appliance was reapplied, but the upper teeth were left free to see if they would remain as they now are or possibly improve under the influence of occlusion.\*

Figs. 28 and 29 are made from right and left profile views of models before and after treatment, with this form of appliance. As in the preceding case, please note the increase in length of the upper dental arch and also that the incisor roots have been carried forward more than the crowns

Figs. 30 to 33 show various models of a case in which the upper second bicuspids were extracted and the spaces closed by drawing the teeth together. When this patient came to me he was eighteen and a half years old and his teeth were as shown in Fig. 31. After careful study it was decided to restore the lost bicuspids. Fig. 32 shows how these spaces have been created, though not seen very plainly, owing to the appliance being in place. Fig. 33 shows the lower casts of this case, the upper one having been made one year previous to that underneath. The lower arch in this case was treated by means of the expansion arch and ligatures until the teeth were as shown on the upper cast in Fig. 33. The Angle appliance was then used and the roots, incisors and cuspids carried forward as shown in the lower cast Fig. 32.

\*Examination of this patient this autumn shows that the upper teeth have relapsed to a considerable degree and it will, therefore, be necessary to readjust appliances for him.

#### Solderina Devices.

By Herbert A. Pullen, D.M.D.

Clinic before the American Society of Orthodontists, July, 1913.

The constructive technic of the new Angle appliances requires more delicacy of manipulation, especially in the soldering technic, than has



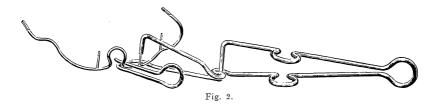
heretofore been necessary for the older appliances with a less number of parts and requiring less accuracy in fitting. Hand soldering, although still effective for the uniting of the larger parts of the new appliances, has given place to a method whereby the smaller parts to be united, such as the vertical tubes to the plain bands, and the upright rods on the middle arch sections are held in jigs or clamps.



Fig. 1.

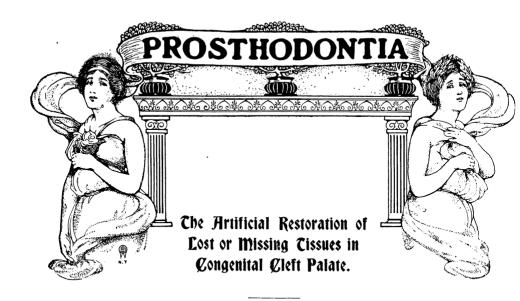
The method followed by the writer is one in which the soldering clamp is made to do the work of the jig in holding these smaller parts of the appliance in approximation during the soldering operation.

Fig. 1 illustrates a combination clamp for holding the vertical tube in position on a plain band while being soldered. Into the upper arm of this clamp is inserted a short section of Stubb steel wire, tapered at one end to receive and tightly hold the small tube, so that it cannot be lost or displaced during its manipulation. The spring of the clamp automatically approximates and holds the tube and band in the position desired for uniting with solder.



A still more delicate soldering operation is that of uniting the upright rods to the middle arch sections, and this is accomplished by the writer by means of another combination clamp shown in Fig. 2.

The upright rod is inserted in a hole of the same diameter in the upper arm of the clamp, where it is held by friction. The middle arch section is slipped into an extra spring arm on the lower part of the clamp, where it is securely held, while the upright rod is adjusted to position and soldered. The angle of inclination of the upright rods is determined entirely by the accuracy of the eye in judging this angle after trying the middle arch section in position in the mouth.



By Dr. Vethake E. Mitchell.

Demonstration given before the Forty-third Annual Convention of the New Jersey State Dental Society, July 16th, Asbury Park, New Jersey.

The value of a method by which this class of oral defects are corrected is judged by the result obtained, and my object in presenting this patient, is to show by actual demonstration the possibilities in the improvement of voice and speech, by means of an artificial substitute for the missing tissues.

There are two reasons for attempting to correct this defect: First, improvement in health, by permitting the passage of air and food through their proper channels; second, the improvement in voice and speech, by restoring to the vocal mechanism the missing tissues and their functions.

The palate is one of the most important organs of voice and speech. Its functions are concerned in the forming of tone of the voice by regulating the size and shape of the resonance chambers, and to close off the nasal passages in the emission of certain sounds.

The vomer, that portion of the nasal septum which is, more or less. missing in all these cases, is also a very important part of the vocal mechanism especially concerned in nasal resonance.



Without any question, surgical closure of the cleft would be the ideal method of treatment, if it were possible to restore all the tissues and their functions, but such is seldom the case.

Appliances of many shapes and of different materials have been devised for the closure of the cleft, but with apparently little regard for the restoration of the nasal passages, to permit of normal respiration, or the restoration of the resonance chambers for the improvement of voice and speech. In the appliance, which I shall present later, all these features or functions have been taken into consideration.



Fig. 1.

The first six months of the unfortunate child's life is a very critical period, owing to its inability to receive nourishment.

Some twelve years ago I devised an appliance which will materially assist them. It consists of a soft rubber plate, covering the roof of the mouth, closing the cleft, to which is attached a rubber nipple, either for bottle or breast (Fig. 1). I will now introduce my patient, Miss K., for whom I made an appliance last June.

I shall pass around the model of Miss K.'s mouth (Fig. 2), to give you some idea of the defective condition of her vocal mechanism. The width of the cleft at posterior border of hard palate is thirteen-sixteenths of an inch, and you will notice the entire absence of the vomer. I do not believe any surgeon would advise an operation in this case. I shall ask Miss K. to let me show you her appliance.

The appliance (Fig. 3), as you see, is constructed of hard rubber and gold, making it thoroughly hygienic, durable, and non-irritating to

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the tissues. The plate which covers the roof of the mouth is firmly clasped to the teeth; the hard palate and vomer are reproduced in hard rubber, vulcanized to the plate; the soft palate, also of hard rubber, is fastened by a hinge, so shaped as to be controlled by the muscular action of the palatal tissues.

(Dr. Mitchell then presented his patient, who performed the vocal exercises indicated below.)



Fig. 2.

Without the aid of her appliance I shall ask Miss K. to pronounce some of the most difficult letters of the alphabet:

First—the labials—B—P—F—V.

The anterior linguo-palatals—C—D—S—T.

The posterior linguo-palatals—G—K—Q and X—Y—Z.

Now an awkward combination, as, "sixty-six."

And a still harder combination, the name of "Dr. Norman W. Kingsley."

With the appliance in the mouth she will repeat this combination, which I think will demonstrate to you a very marked change in the quality of the voice, her articulation and enunciation.

 $(Miss\ K.\ repeated\ the\ above.)$ 

Now to see what is possible with the singing Singing Demonstration. voice, we will be assisted by Miss Adelaide Gescheidt.

Miss K.'s vocal teacher.



1. Through the development of her breath control, and by a unique card-buzzing exercise, to develop certain phases of the voice, she is now able to blow a steady flow of breath through the lips, and she will open her singing demonstration by a little exercise in card-buzzing—to show breath control.

(Buzz card.)

2. Next, the scales of thirteen vowels and thirteen consonants will be used. These scales have been arranged so discriminately in their sequence in vocal art science, that by their correct use each and every

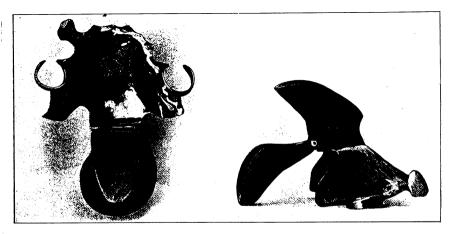


Fig. 3.

resonator from the tip of the nose to the epiglottis is exercised, and finally all are correlated, or coupled.

With the use of the scale of consonants and vowels all muscles for articulation and enunciation, namely, the lips, tongue and palate, are exercised and developed, and perfect *pronunciation* is the result.

Miss K. will demonstrate the above combination—First, to show her breath control and tone quality, she will sustain the thirteen vowels at three or four different pitches.

Then to show *her* use of the scale of thirteen consonants and vowels she will sing them on chromatic scales, and reverse the order of syllables on descending scales.

(Miss K. sings scales of thirteen vowels and consonants.)

3. To demonstrate the practical use of the mechanical appliance in showing the foremost and highest nasal resonance, she will sustain the



combination of ING-N-M, and will prolong the sound of M to show its position in the singing quality.

(Miss K. sings ING-N-M.)

4. To demonstrate the perfect mechanical action of the appliance she will sing an arpeggio that moves from a lower to a higher pitch in the ascension. This necessitates a rise and fall of the normal palate and is perfectly apparent with the artificial palate.

(Sings arpeggio.)

5. Miss K. will finish her demonstration by singing two short ballads, At Dawning and A Bowl of Roses, by Clarke. This is to show the combination of articulation, enunciation, pronunciation, and also the legato in singing. The latter necessitates perfect breath resistance against the upper incisors, which again, is made possible by the mechanical appliance.

Let me say in conclusion that Miss K. in the training of her singing voice, and perfecting of her articulation, and enunciation, has had only twenty-six lessons thus far.





## Che Human Mouth in Its Relation to Preventive Medicine and Public Health.

By W. G. Ebersole, M.D., D.D.S., Sec'y-Treas., National Mouth Hygiene Ass'n.

Read before the New Jersey State Dental Society at Asbury Park, N. J., July, 1913.\*

The most important organ in the body from the standpoint of preventive medicine is the human mouth. Notwithstanding this fact, no other organ of the body is so little considered by the members of the medical and dental professions and by the laity.

The mouth is the principal harbinger and most extensive breeding place for and the widest disseminator and pathogenic micro-organic life, and yet into and through it must pass the nourishment which goes to support human life.

Scientific investigation shows that 97 per cent. of the public school children of this country have diseased or faulty mouths. High as is the percentage of defective mouths found among the school children, the rate is still higher in adult life.

Caries a Devastating Disease.

If I were to poll a vote of the members of this learned body as to which is the most prevalent and devastating disease known to mankind, experience has taught me to believe that at least 90 per cent. of those present would vote in favor of tuberculosis.

while a large proportion of the remaining 10 per cent. would be inclined to place syphilis on a par with tuberculosis. I am here on this occasion, however, to tell you that the most prevalent and devastating disease known to mankind to-day is dental caries, tooth decay.

 $<sup>^{*}\</sup>mathrm{Dr}.$  Ebersole was too ill to be present and the paper was read by a member of the Society.



It takes considerable courage for a man to step upon the platform and make this kind of a statement in the presence of this scientific body, before a body of men and women that have been taught to believe that tuberculosis is entitled to the rank and recognition just accorded to dental caries.

But, ladies and gentlemen, I wish to repeat my statement that dental caries, or decay of the teeth, is the most prevalent and devastating disease known to mankind.

I wish to go a step further and say that I am prepared to prove this statement.

I have personally directed investigations throughout the United States which prove beyond a doubt that practically 97 per cent. of the school children have diseased or faulty mouths. These examinations have been substantiated by leading investigators throughout the world, and these figures are now recognized as being approximately correct.

If these figures are correct, and they are correct, I do not believe that there is a physician or surgeon in this room but will concede that dental caries is the most prevalent disease known to-day.

Experiments with School Children.

Learning the extent to which this disease prevailed in the human family, I undertook to conduct a series of experiments which would in a measure enable me to estimate the extent to which this disease influences the health, strength and working effi-

ciency of mankind.

Selecting the forty children having the worst oral conditions in a school of eight hundred and forty-six pupils, a school in which medical inspection had been in force for three years prior to our experiments, we undertook to show the improvement that could be brought about from a psychological standpoint.

In selecting these children, a complete and careful examination of the mouths was made and the history and class records of the children taken for six months before treatment began.

Two sets of psychological tests were made at the beginning of our experiments to prove the actual working efficiency of the children at the time they were received for care and treatment. They were given full and complete instruction on how to care for and use the mouth; and a nurse was placed over them for the purpose of securing their co-operation in the work we were undertaking, and dental service was furnished to correct all faulty oral conditions.

The majority of these children were repeaters, and many of them were kept in school only by the activity of the Truant Officer.



Two special meals were served to these children for the purpose of teaching them how to properly use their teeth, and following the meal they were instructed as to how to properly care for their mouths.

Of the forty children selected, five were dropped the first day because they would not agree to perform the duties which were required of them; and during the year's experiment eight more were dropped because of the failure upon their part to carry out the instructions given.

A remarkable showing was made as a result of these experiments. From the first of June, 1910, to the first of June, 1911, there was not a single case of illness of any member of the class. The school records, efficiency, attendance, conduct and physical appearance showed wonderful improvement, while from a psychological standpoint the mental tests showed an average improvement of 99.8 plus per cent. for the twenty-seven children finishing the work.

Do not misunderstand this statement; we said that the psychological tests showed an average increase in mental working efficiency for the year of 99.8 plus per cent. We did not say that this increase was due to the correcting of faulty conditions of the mouth, in other words, the filling and cleaning of the teeth; nor did we say that this improvement or increase in working efficiency was all due to correcting faulty oral conditions and the teaching of the proper care and use of the mouth. A part of this improvement was due to the natural growth and development of the children; but by far the greater part of the improvement was due to correction of the faulty oral conditions found, and the teaching of the proper care and use of the mouth. By care we mean proper cleanliness, hygienic conditions. By use we mean the selection of suitable food stuffs and the proper manipulation of them while in the oral cavity, so that the best possible results may be brought about.

The showing made by this class was startling indeed, and the greatest shock was felt by the dental profession, which for the first time received definite proof of the importance that the mouth bears to the health, strength and mental working efficiency of the individual.

The importance, then, which the mouth bears to the general physical condition of mankind entitles it and those who are devoting their lives to its needs to a full recognition and consideration by those organizations, municipal, state and national, which have to do with the physical welfare of the human family.

The mouth.

The mouth.

The mouth.

The mouth.

The mouth is the distance of the mouth is the most neglected and ill-kept organ of the human body. It is the principal harbinger and most extensive breeding place



for pathogenic micro-organic life; and it is the path through which most of those organisms enter the human system.

In it grow and develop those micro-organisms which are responsible for the most prevalent and devastating diseases known to the human family. We refer to the micro-organisms which produce dental caries—tooth decay.

For years the health organizations throughout the world have been spending millions of dollars in their efforts to bring to the human family food, water and air free from micro-organic life which would produce pathogenic conditions within the consumer.

Much good has been accomplished, to be sure. But let me ask this scientific body how much we have gained when we have brought food and drink to the consumer, at this tremendous cost, and then before they can reach the source for which they were intended, that is, the nourishing of mankind, they must pass into and through grinding machines, 97 per cent. of which are filled with pathogenic micro-organic life, there to have thoroughly mixed and incorporated in them the very kinds of micro-organisms our millions have been spent to destroy or eliminate from these necessities of life?

We again ask, How much have we gained? We are willing to concede that a *great* amount of good has been accomplished; but that which has been accomplished is so infinitesimally small as compared with that which might have been derived had a few of the millions which have been spent in keeping food stuffs free from pathogenic micro-organic life been spent in giving to humanity, or in teaching humanity how to have food-grinding machinery, healthy and free from these organisms.

With more than 97 per cent. of the people with diseased or defective mouths, every one of which is a harbinger of pathogenic microorganisms, we would ask if we have not overlooked or neglected in our search for sources of infection the greatest producer and at the same time the widest disseminator of disease-producing germs?

Of the more than one hundred and fifty varieties of micro-organisms which have been found to inhabit the human mouth, many are of the kind for which the millions have been spent in an endeavor to prevent the carrying of contagion or infection to the human organism.

In fact, many of these micro-organisms are almost invariably present in the mouth and have been found to grow and develop with remarkable rapidity in this ideal breeding place.

You are familiar and thoroughly conversant with the manner and means whereby the organisms which produce typhoid fever, scarlet fever, diphtheria, pneumonia and tuberculosis are transferred from one indi-



vidual to another, and know only too well the tremendous havoc these organisms are capable of producing when unrestrained.

But we want to say to you that the micro-organisms which produce dental caries, or decay of the teeth, are just as readily transferrable from child to child and from adult to adult as the other organisms just mentioned, and are wielding a far greater havoc in the human family than all the others put together.

Views of Prominent Scientists.

In support of the statements just made, let me quote from Professor Osler, a man from the medical ranks, who was sufficiently well posted in this direction to make the following statement before a body of dentists and dental students three years ago. He

says:

"You have one gospel to preach, and you have to preach it early and late, in season and out of season. It is the gospel of cleanliness of the mouth, cleanliness of the teeth, cleanliness of the throat. These three things must be your test throughout life. Oral hygiene, the hygiene of the mouth—there is not one single thing more important to the public in the whole range of hygiene than that."

Recently in Chicago, Dr. Charles Mayo, of Richester, Wis., after citing a number of cases in which infection, hitherto unexplainable, had been traced to abscessed teeth—either blind or apparent—made this declaration:

"It is evident that the next great step in medical progress in the line of preventive medicine should be made by the dentists. The question is, Will they do it?"

A series of experiments conducted under the direction of Dr. W. A. Evans, former Commissioner of Health of Chicago, traced the spread of pneumonia, scarlet fever, diphtheria and kindred diseases to dental caries or diseased teeth.

From Dr. William Hunter's article on "The Rôle of Sepsis and of Antisepsis in Medicine," we beg to quote the following extracts:

"In the foregoing sketch of the chief spheres of the doctor's work and interest, I omitted any reference to one other portion of the body which constantly comes under his observation; indeed, more often than any other—I mean the mouth. This omission was intentional on my part. The cases presently to be described—which could be multiplied by thousands and tens of thousands coming under the daily notice of doctors—illustrate how constant this omission is in practice."

"What I desire to impress upon you students, and all students entering the profession, and all those already engaged in the practice of the profession, is, it is "not a matter of teeth in dentistry." It is an all-important matter of sepsis and antisepsis that concerns every branch of the medical profession, and concerns very closely the public health of the community. It is not a simple matter of "neglect of the teeth" by the



patient, as is so commonly stated, but one of neglect of a great infection by the profession—a great infective disease for which the patient is not primarily responsible any more than he is responsible for the contraction of typhoid fever or tuberculosis. The condition referred to is that to which I have given the name of 'oral sepsis.'"

"One would think poorly of a surgeon or doctor who declined to take the responsibility of treating a follicular (that is, a 'septic') tonsilitis, but insisted on handing over the case to a throat specialist, or who allowed a patient to suck continuously a number of septic sores on his finger. I think no less poorly of any doctor or surgeon who declines to make himself responsible for the treatment of much of the oral sepsis presented by many of his cases. For this is what patients are constantly doing. Wherein consists the pathological difference between a follicular tonsilitis and a foul, septic, suppurating condition of the gums, with deposition of calcareous 'crusts and scabs' (so-called tartar) covering and hiding septic wounds and ulcers, loaded, as microscopic examination shows, with staphylococci and streptococci? None whatever, except that the latter is exceedingly common and the tonsilitis is comparatively rare. pathological condition in both is the same; namely, sepsis. Moreover, it is a sepsis as easily recognized, and much of it as easily removed in the case of the one as in that of the other, and the more urgently requiring to be removed, since it is more important as a potential disease factor than any other source of sepsis in the body."

"The chief feature of this particular oral sepsis is that the whole of it is swallowed or absorbed into the lymphatics and blood. Unlike the sepsis of open wounds on the outside of the body, none of it is got rid of by free discharge at the surface. The effects of it, therefore, fall in the first place upon the whole of the alimentary tract from the tonsils downwards. These effects include every degree and variety of tonsilitis and pharyngitis; of gastric trouble, from functional dyspepsia up to gastritis and gastric ulcer, and every degree and variety of enteritis and colitis and troubles in adjacent parts, e. g., appendicitis. The effects fall in the second place upon the glands (adenitis); on the blood (septic anemia, purpura, fever, septicemia); on the joints (arthritis); on the kidneys (nephritis), and on the nervous system."

"Nine-tenths of the cases of dyspepsia and gastric trouble which I see are caused or complicated by similar oral sepsis, and respond at once to removal of this sepsis. Nevertheless, the sepsis is overlooked because not looked for."

Oral Sepsis. Is it not then reasonable that one more closely in touch with oral phenomena in its relation to health should make such statements as I have made, when men like Osler, Hunter, Mayo and Evans make such

statements as I have quoted?

Let us consider for a moment. We have told you that 97 per cent. and more of the mouths of the people of this country are diseased, and that in every one of those 97 per cent. the "tooth-destroying" microorganisms are found. And that in every mouth where the "tooth-destroy-



ing" micro-organisms are found we have a pathogenic condition, and in every mouth where these organisms are permitted to become active the best possible breeding place is found for the pathogenic micro-organisms with which you gentlemen are so familiar.

Not only do the "tooth-destroying" micro-organisms aid in producing breeding ground for other pathogenic micro-organisms, but they by their action produce two of the most favorable conditions for possible infection.

First, by their activities around the necks of the teeth they produce softened and bleeding gums, which offer an excellent opportunity for infection. Second, by their inroads into the tooth substance they destroy the dental tissue until the dental pulp is exposed, producing the best and probably most frequent means of infection.

A tooth with an exposed pulp, or more particularly one with a dead pulp, the cavity or pulp chamber of which is filled with pathogenic microorganisms, becomes the best possible means for producing infection, because in the chewing of the food the pulp chamber acts in the capacity of the barrel of a syringe, and the food stuffs forced into the same act as a piston, thus forcing the contents into the soft tissue at the apex of the tooth.

The percentage of infection which takes place through this means no man can estimate. But when we consider that of the enormous number of mouths that have dental lesions, at least 50 per cent. of them show teeth which contain exposed or putrescent pulp, we may be able to explain many of the heretofore "not understood" sources of infection.

Thus far we have spoken of the mouth and the influence it wields for good or for evil from the hygienic standpoint.

In the medical profession we have specialists who devote their time and attention to every other part of the body, save the mouth. The medical men have side-stepped here and left the mouth to the dental men. The medical men have considered the dental men the oral specialists, and the dental men, almost to a man, have until recently failed to grasp the full responsibility which rested upon their shoulders and to realize that upon them rested the importance of proper oral conditions.

Most dentists have been tooth specialists instead of oral or mouth specialists. It is only when the dentist realizes his responsibility in the latter capacity that he assumes his true relation to the public health in his community.

With oral conditions as we find them, and with the influences which they exert upon the public health and general welfare of the human family fully recognized, and with the dental profession alone occupying



the field of oral specialist, it is to this profession that we must turn for the correction of the faulty conditions which here exist.

To the dentist belongs the mission of teaching prevention, and the correction of dental lesions. In teaching prevention he must do so from two standpoints.

Duty of the Dentist. First: He must teach that "A clean tooth never decays," and must therefore instruct his patients in the performance of a correct dental toilet.

Second: He must also teach that "A lazy tooth becomes in time a rotten one." He must therefore teach when and how to properly use the teeth that they may not only perform their full duty as related to the general digestive tract, but that they may in turn, by their proper activity, aid in their own self-preservation.

And, last and least, it is the dentist's duty—when dental lesions occur—to correct or repair the same.

Too often with the dentist of the past the last has been first and the first has been last; but to-day, thanks to the activity of the few, the many are awakening to the importance of and giving full thought and consideration to prevention, while correction and repair is assuming its proper position in the scale of importance, that is, that of being secondary to prevention.

To the dentist then belongs the mission of teaching how to keep the mouth in a condition where it can fulfill the purpose for which the Creator intended it.

With the dentist responsible for the health of the mouth, it becomes necessary, in order to establish the true relation of the dentist to the public health of the community, to show what influence the mouth bears in that capacity.

I know of no better illustration of what an important part the mouth plays in the health of the individual than that which has been shown by the activities and research work of Mr. Horace Fletcher, the man who at the age of forty was a physical wreck, "being on the scrap heap," as he puts it, denied insurance by the insurance corporations, and condemned to an early death by the examining physicians, has so far developed his physical being that at the age of sixty he was not only able to stand the most severe tests of strength, but to practically double the records of the best athletes in the leading colleges of the country.

And what has been the principal secret of this development? It has been the proper *use* and *care* of the oral cavity—the first three inches of the alimentary canal, as he puts it—the mouth, the most important organ of our physical being.

The people must be taught to know and do those things which will



produce and maintain perfectly healthy oral conditions, and to accomplish this at this time the dental profession is essential and must fulfill its duty and its obligation if humanity is to come into its own.

The time is coming when medical men will wield sufficient influence to bring about a correction of faulty oral conditions, but now when the human mouth is the most neglected and ill-kept organ of the body, medical and dental men must combine and operate under the most ideal circumstances if the greatest good is to come to the greatest number and come to the present generation.

## Sources of Infection.

Let me call your attention to a few facts that have been long recognized, but little understood. For years the physician has asked to see the tongue and the throat for diagnosis. Each carries its message,

but the story has been only half understood.

The coated tongue, for instance, tells a story, but to the physician it is of things that lie beyond the tongue that it speaks, and not of the condition of the tongue itself. The coated tongue tells of lowered resistance, and by its appearance may tell something more. But what makes this coating? What is it? It is micro-organic life that lowered vitality has permitted to multiply in such numbers that the whole mouth is filled with them and the tongue with its rough surface furnishes the best lodging place for them.

We have come to recognize something of the influence the mouth has on health.

Kissing has been tabooed—except on stated occasions; the individual communion cup has been adopted by the church. The public drinking cup has been forcibly discarded as an abomination. Anti-spitting ordinances have been passed in all our large cities.

So far, so good, But what of the coughing, sneezing, singing, talking, yes, even the smoking public, with ill-kept and uncared-for mouths, from which when in action millions upon millions of micro-organisms are sent floating out upon the air? Stop the kissing if you can, arrest the spitter if you will, prohibit the public drinking cup if you must. Do these things and you have made progress; but to give to humanity that to which she is entitled from a hygienic standpoint, you would have to place gauze muzzles on over 90 per cent. of the people. We muzzle dogs to avoid one kind of disease. Why not muzzle man to avoid the many other kinds of diseases? It might be ideal, but hardly practical.

But to turn from jest to earnest. We have made progress in preventing the transferring of many micro-organisms from individual to individual, but much remains to be done here. What have we done for the individual whose faulty mouth is a serious handicap?



Most of the efforts thus far have been made toward preventing the spreading of disease, with practically no effort made to remove the cause. The diseased individual has been given no thought or consideration. We have not been concerned with his physical welfare.

Our method of dealing with diseased mouths has been about on a par with the activities of an officer who, upon learning that a dog affected with hydrophobia was loose in the neighborhood, spent his time in warning people to keep off the street, to keep the children in the house and their dogs chained up, making every effort to keep people and animals from coming in contact with the diseased dog, but making no effort to destroy the diseased animal.

We have been laboring to avoid an effect without first removing the cause.

The National Mouth Hygiene Association's plea, ladies and gentlemen, is for the removal of the cause, and the effect will take care of itself. Let us deal with the mouth of the individual both in his interest and in the interest of humanity at large.

What the mouth means to the individual has been told in a measure by the experiments on the Marion School Class. What has been done for the individual can be done for the public at large. It is ours then to teach and preach the power and influence the mouth wields for good or for evil.

Let us know and understand the influence the mouth bears to the health, and then let us concentrate our efforts in teaching the proper care and use of that organ, and let us do this in the interest of the health, strength and beauty of the human family.

In conclusion, let me summarize by saying that we are for health inspection, because under that heading medical, dental, legal and educational activities could be combined in the great cause of humanity.

We would not narrow down health inspection to the schools, because that which is good for our public schools in the way of health protection is good for humanity at large.

We should have health inspection, not only in our public schools, but in all educational institutions. We should have health inspection in the State institutions, health inspection in stores and factories. In fact, we should have health inspection in all places where great numbers of people are compelled to congregate or are housed for hours at a time.

We are for that kind of health inspection and instruction, if you please, that in so far as possible guarantees to the unborn child of the future, parents free from diseases or defects, which are known to produce faulty offspring.

We are not for medical inspection as practiced at present, and we



are not for dental inspection as advocated and practiced to date. In fact, ladies and gentlemen, we are not for the present educational system employed in most of the schools to-day.

We are not in favor of the present educational system because it is producing mental giants with bodies so undeveloped that sooner or later one or the other gives way and we have wrecked the life and influence of a human being.

We are for an educational scheme or system which will include al! the good that medical inspection and instruction can give; all the benefits which may be derived from dental inspection and instruction, and all the good that comes from our present public school educational system, combined and worked out in such a manner that we will be creating or developing future citizens of the United States equally strong mentally and physically.

Let us all unite in an effort to induce the municipal, state and national governments of this country to give at least as much attention and thought to the individuals that compose their population as they give to the beasts of burden and to the animals which supply much of our food.

The story is told of a young woman who lost her husband and was left with a family of small children, whom she was trying to support. Her health was failing and she feared tuberculosis. She addressed a letter to the United States Government, stating the condition under which she was operating, and her fear of tuberculosis, and asked the Government to aid her in her fight for health. It is said she received a reply that the Government could do nothing for her.

Within the next day or two a neighbor, who was a raiser of hogs, discovered in his drove that which he believed was "hog cholera." He communicated his suspicions to the National Government, and at once it became violently active.

Let the horseman, the dairyman, or the raiser of hogs call for help, or let a neighbor sound the warning and plead for protection, and national, state and local governments rush their agents to the scene to offer all possible assistance in stamping out the diseases that are so destructive to animal life. The telegraph, the telephone and the rapid transit are none too swift then to carry aid to the needy.

In the case above referred to the hogs were saved, but the young woman died.

Ladies and gentlemen, we are in favor of a public health institution which spends at least as much money in the preservation of the lives of the men, women and children of the country as it devotes to the preservation of the lives of the dumb beasts of the field.

It has been my mission to talk to you on the "Human Mouth and



Its Influence Upon the Health, Strength and Beauty of Mankind," and I am asking you to join those of us who are interested in this most important organ of the human body to help us instruct mankind in the care and use of that organ to such an extent that its importance may not only be thoroughly understood, but that all health workers and instructors should recognize the value of healthy and properly developed mouths; for no organ of the human body plays so important a part in controlling the health and strength of the human being.

Let us then live such lives and care for our bodies in such a manner that that which goes in through the mouth and that which comes out through the mouth may pass without danger of being befouled while en route.

Let us care for the "gateway to the human system" in such a way that we may give back to God man as he intended he should be—a perfect physical being.

The story I told of the farmer's widow who asked for help in fighting tuberculosis and of the farmer who asked for aid in stamping out disease among his hogs bids fair to become a classic. The moral usually drawn from this tale is that it is better to be a sick hog to be looked after than a sick human being to be neglected. The National Mouth Hygiene Association would change this, however, and say, instead, that it is better for a government, after providing fully for the health of its \$250,000,000 worth of American hogs, to pay at least a little attention to the health, strength and working efficiency of its \$250,000,000,000 worth of American citizens.

The National Mouth Hygiene Association is interested in all phases of health conservation; but because of the fact that almost every other part of the body has been given full thought and consideration in connection with health propositions except the human mouth, it was found necessary to form an organization which would devote its entire attention to teaching and preaching the proper care and use of that organ of the body which wields the greatest influence in the preservation of the health, strength and beauty of the American people.

Ladies and gentlemen, if we are to do the greatest good to the greatest number we must unite in the great cause of health conservation through the activities which are being employed by the organization I have the honor to represent upon this occasion, The National Mouth Hygiene Association.



# Che Ideal Method of Spreading the Oral Hygiene Propaganda in Communities.

By George F. Burke, D.D.S., Detroit, Michigan.

Read before the Fourth International Congress on School Hygiene, Buffalo,

N. Y., August, 1913.

#### Ladies and Gentlemen:

I will quote to you, from one who is generally regarded as an impressive authority, a statement which may incur the displeasure of the valiant cohorts who are banded together against the devastations of the Demon Rum, but I would make it clear that it is not because I love their cause less, but my own more, that I refer to Dr. Osler, who said: "If I were to say whether more physical deterioration was produced by alcohol or by defective teeth, I would unhesitatingly say, defective teeth."

There are few who have not been, either directly or indirectly, confronted with the havoc wrought by excessive indulgence in alcoholic stimulants, but the havoc from defective teeth is far less spectacular and more insidious, and so more dangerous to the health and happiness of a humanity unwary and, therefore, unprepared to meet the foe that menaces it. It is because of these facts, obvious to anyone who has given them the most superficial thought, that I consider Dr. Osler's opinion so valuable and illuminating.

Few of us even who regard ourselves as deeply initiated have a right appreciation of the hidden horrors that lurk in the neglected and diseased mouth. I believe that we shall awaken to a somewhat startled realization of the overwhelming importance to human welfare of clean, wholesome mouths.

But this is not exactly a comfortable idea to dwell upon when we consider how rare, how very rare, are the clean, well-cared-for mouths and sound teeth.

But I need not plead before this gathering the cause of oral hygiene. My part consists rather in telling you the story of how the first steps toward a better order of things have been taken in Detroit; how this was made possible and what forces were brought to bear. It is not a spectacular nor a dramatic story in any sense, but is chiefly significant because Detroit was one of the first cities in the United States to provide for the care of the teeth of its school children. My story will be valuable only in so far as I shall be enabled out of our experience in Detroit to point the way, to some extent at least, to others who are anxious to do similar service to the future citizens of their community.

8<sub>53</sub> nov.



Merely to be imbued with the spirit of altruism, or to be ready to sacrifice ever so valiantly, will, I believe, avail little unless the propagandists are as shrewd as they are unselfish, as diplomatic as they are valiant. Especially is this true if your cause is or seems to be a new one.

Those who plead for universal oral hygiene are practically preaching a new doctrine. The great mass of human beings—that great mass whom it is most necessary to reach—have never heard of it. Nor are they keen for the news. To tell the bald truth, they are bored to death with all the new preachments that have been thrust upon them during the past few years. The great humanitarian wave that has been rolling larger and larger has touched them again and again, not only to bring them relief, but to urge new efforts and impose new obligations upon them. The visiting nurse, with her pleas for open windows, ventilation, cleanliness, and the rest; the babies' milk fund associations, with their detailed instructions for keeping the infant's milk clean and cool, and himself sweet and happy during the torrid summer days; the health and hygiene committees, with new ideas for the care of garbage; the civic improvement bodies, showing how to convert a filthy alley into a shining, vinebordered lane; the juvenile auxiliaries, eloquently pleading for greater vigilance over the boy and girl—and a dozen others.

And nearly all of these things are put up to the mother. If her family be large she is already overburdened with innumerable harassing drudgeries, and now she is asked to learn new lessons by the score, to take in countless new ideas, often bewildering and nearly always difficult. But here let me offer by humble tribute to this mother of the masses. I believe that most workers in the field of social service will agree with me that she is far more receptive of new ideas, far more open-minded and responsive, than the man of the same class whose almost invariable objection to any innovation is that he was brought up on the old methods, and that what was good enough for him is good enough for his children.

The mother's more intelligent and less egotistic attitude as embraced is a desire to give to her children something better than she ever knew. I have wondered if this is not a rather forceful argument in favor of the feminist movement. But, as Kipling would say, "That's another story."

But far more discouraging and inexcusable than the inertia of the poor is the smug indifference of the provincial-minded, who, being themselves protected against the devastations of defective, decaying teeth, absolve their consciences by refusing to credit the reports of those who have made a thorough and intimate study of conditions. Not that I mean to imply that the well-to-do, nor even the rich, need not to have the doctrine of preventative dentistry preached to them. The truth is,



that the use of the tooth brush, the diseased mouth and a general ignorance regarding the meaning and importance of oral hygiene are not only a little less common among the prosperous than the poor.

How, then, with the ignorance and apathy of the great mass of the people to reckon with, could you expect ardent espousal of this long-neglected cause on the part of their public servants in the boards of health and education, or a lively response from the 'Aldermen and estimators for appropriations for this work from out of the public funds?

Difficulty of Educating the Public.

Clearly it is a matter of education among the high and the low—the wise and the foolish. But education, even of the most superficial kind, is a slow process. We wanted to do it as well and as quickly as might be. How to send out the news

into the highways and byways. How to let the fathers and mothers know that often their children are frail and sickly because they are ill-nourished. in spite of plenty of food; how to show them that malnutrition is directly due to the wrecked teeth, that the black, ugly stumps, foul and diseased, might have been white and sound, supplying the means that Nature provided for the proper mastication of food and the resultant wellnourished body. How to make them see that the neglect of their children's teeth is the perpetration of a cruel injustice upon those they love—that it all means a future of suffering and humiliation, of almost inevitable disease and retarded physical and mental development. How to reach the growing girl—to warn her that unbrushed teeth means a future full of humiliations and hurt vanity, as well as physical deterioration that will damage her good looks irrevocably; how to bring home to those who are entrusted with so large a share of the public welfare that in Detroit, as elsewhere, fully 96 per cent, of the school children have defective teeth. To make our voices heard where so many others were clamoring was a problem. The question was how to reach the greatest number of people with a minimum waste of effort and in the shortest possible time.

Power of the Press.

There is much criticism in our day of the press—just as there is of the pulpit. How much or how little deserved I do not know; but this I do know, that there is no power so overwhelming, so far-

reaching, so swift and penetrating, as this power of the press. The papers reach all the people all the time. Despite pooh-poohing to the contrary, print is impressive. This, too, I have discovered out of my experience—if the mother in the home is indifferent because overburdened; if the father is indifferent because naturally reactionary; if the well-to-do are indifferent because untouched by the needs of those lower in the social



scale, and if the political boards are indifferent because of the indifference of these others, there is one, who by the very nature of his profession, cannot afford to be indifferent. He is the newspaper man. To the newspapers I cannot give too large a share of the credit for the success of our movement in Detroit and throughout Michigan. Intelligent and sympathetic reports of the efforts being made by some of the dentists to save the children in this respect were given in the news columns; interviews on the need and the best methods of meeting it were used; editorials setting forth the meaning of this special phase of the big humanitarian impulse were printed in all the papers, and, what perhaps reached the greatest numbers, were the Sunday feature stories with their striking headlines running across the entire page and illustrated to show graphically how terrible a thing the neglected mouth may become.

No other means of education, of spreading the news, goes so far or so quickly as this. No influence for conquering indifference, especially on the part of politicians, is half so powerful. Those among them who had preferred to regard as a "fad" the effort to save children's mouths from wreck, changed their viewpoint with gracious alacrity. There is no ally so powerful as the newspaper, and for the encouragement of those who have been disheartened by the slow progress of this great work of saving the future generations from the results of their neglected mouths I wish to point to the increasing numbers of newspaper articles appearing in the various metropolitan dailies. Only a couple of weeks ago a New York paper with a tremendous circulation printed a striking article in its Sunday feature section, popularly treated and copiously illustrated and setting forth the facts in trenchant style. That article entered the homes of tens of thousands on a day when people had leisure to read.

I have been asked to speak to you on the ideal method of spreading the propaganda of mouth hygiene in communities. I do not know whether we adopted the ideal method in Detroit, but we endeavored to act as wisely as possible; not to precipitate, although it was our earnest desire to get results as quickly as possible. Briefly, our course has been this:

Spreading the Doctrine of Oral Kugiene.

It was about five years ago that the First District Dental Society of Michigan passed a resolution providing for the appointment of a local hygiene committee. This committee, with Dr. W. A. Giffen as chairman, immediately set to work to find a

suitable place to begin operations. Grace Hospital, one of the largest in Detroit, furnished us a room, and we, with funds raised from among our own members, equipped it. Several of the younger dentists offered



their services on Saturdays, and for three years this little philanthropy continued, while we kept our enthusiasm alive with one thought, that this was the nucleus, the first impulse toward the larger movement in oral hygiene which would ultimately include all the school children in our fast growing city. The clinic was a success; hundreds came, and at the end of three years another was established in the Health Board building. It was still up to us to provide funds for the equipment, and this we did by asking the aid of the local dealers and dentists. The Health Board paid the salary of one regular operator. Hundreds of children were treated, and the favorable attention of the hospital authorities, the Board of Health and the newspapers was thus attracted to the need of this work. It was then that an event occurred fortuitous for the progress of our aim. Hon. Chase S. Osborn, then Governor of Michigan, appointed to membership on the Board of Health Dr. Charles H. Oakman, a prominent dentist and oral surgeon. He is a man of breadth and sympathy and he spared no efforts to secure an appropriation for dental clinics and inspection in the schools. It was chiefly through his efforts that \$5,000 was included in the Health Board budget. The local oral hygiene committee still possessed a fund of several hundred dollars-enough to do the thing it needed most to do-to inaugurate a campaign for the spreading of sentiment in favor of this work—a sentiment whose existence was already being felt. We still had to make sure that the city authorities would allow for the oral hygiene work included in the Health Board budget. We approached the newspapers, and of their great aid I have told you. Immediately following upon their editorials we sent out five hundred petitions, calling attention to the suffering caused to helpless children from neglect of their teeth and to irremediable results upon their general health if allowed to continue. These were sent to dentists, to the women's clubs who are active in behalf of progressive measures in our city, and circulated through the stores and factories. In a month we had secured some twenty thousand signatures. I shall not bore you with the details of our efforts for bringing to bear upon the Aldermen and estimators every possible pressure so that they would not refuse the \$5,000. They did not refuse, but allowed the entire sum.

Now we began to direct our energies to ascertaining just how this money could be used with the greatest possible good to the children of our city. We referred to well-known authorities on mouth hygiene and found from such men as Ebersole, Evans and Warthin that there should be at least one general dental inspection each year, and the balance applied to clinics.

This year, with a precedent and a record of service to point to, we



felt safe in asking for an appropriation of eight instead of five thousand dollars. It was granted. We are in this way enabled to employ two additional inspectors and establish two new clinics, and the young men employed in this capacity look upon their work as more than a mere "job." I believe that without an exception it is to them an opportunity for service in a field where it is woefully needed.

No account of the progress of oral hygiene in Detroit would be halt adequate without reference to Dr. Charles E. Chadsey, Superintendent of Schools in Detroit. A man of broad outlook, who realizes that education is far more than a mere academic process; who knows that it must follow the child into the innermost sanctum of his home life and help him to conserve and nourish his physical forces and show the way to a right mode of living. Dr. Chadsey more than once raised his voice in behalf of the tooth brush and systematic inspection and care of the teeth of the school children.

I should say that no scheme for spreading the doctrine and extending the practice of oral hygiens can be ideal without lectures. Well-delivered, popu-

larly treated illustrated lectures will carry the message to hundreds who otherwise would not be reached. In Detroit the Federation of Women's Clubs has for years maintained a series of winter lectures, given evenings in the school houses, in the social centres and settlements and in the various clubs organized among the men and women of the working classes. There is such a strong penchant for organization of every sort and kind in our day that it is an easy matter to find groups of people gathered for an evening's diversion. If you can teach them a new lessor pleasurably they will listen. The story of what ruin a neglected mouth may work, deftly handled, is not without its dramatic possibilities.

Lectures, inspection of the teeth of school children by dentists, clinics. as many and as well advertised as possible, with always the backing of the press and their co-operation in printing stories—these are the media through which the child may be helped and saved from the tragedy of a wrecked, diseased and disease-producing mouth.

It is not always an easy thing to start the ball rolling—to overcome the prejudice and apathy inherent in so large a proportion of people of all classes. But the fight is tremendously worth while, and if professional jealousies and petty, befogging issues can be forgotten, and cooperation among the dentists achieved, the struggle is not half so hard—the results far quicker and more splendid.



# New Jersey State Dental Society — Forty-third Annual Meeting. Opening Session, Wednesday, July 16, 1913.

The forty-third annual meeting of the New Jersey State Dental Society was held at Asbury Park, New Jersey, the opening session convening at 10 A.M. on Wednesday, July 16, 1913, the President, Dr. William I. Thompson, in the chair.

The session was opened with prayer by Rev. Garrett M. Conover, and a most interesting address of welcome was delivered by the Hon. Reginald S. Bennett, M.D., Mayor of Asbury Park.

## Address of Welcome.

Mr. President and Gentlemen of the New Jersey

R. S. Bennett, M.D. State Dental Society: I am glad to have this opportunity to be with you and to extend to you all a hearty welcome to Asbury Park. You are all so well acquainted with the many advantages of our heautiful city that I would consider it up-

the many advantages of our beautiful city that I would consider it unusual for me to dwell upon that point. I congratulate this Society upon its growth and prosperity. It has been my fortune to attend several of the meetings of one of the component societies of the State organization—the Monmouth County Society—and, in fact, on one occasion I had the boldness, upon the invitation of the President of that society, to read a paper. The subject of that paper was "Dentition." I spent a great deal of time on that effort and produced what I thought was really a very creditable paper, but the way that paper was discussed and banged about and torn to pieces at once made me form a conclusion that I knew very little about dentition, and with what limited egotism I did have left I formed at the same time another conclusion, and that was that the



dentists then present at that meeting knew very little about medicine. (Laughter.)

I congratulate this Society for its purposes. The purposes of the New Jersey State Dental Society I assume, being a medical man, are a great deal like those of the New Jersey State Medical Society. They stand for those things that are elevating and uplifting in the dental world, no doubt, the same as the New Jersey Medical Society stands for like purposes in the medical world. The results of these meetings are farreaching. They produce better legislation; they raise the standard of elucation among the members of the profession who, on these occasions, meet to rub elbows with each other and exchange ideas; to influence members of the fraternity to be members, which means, above all, that you reduce commercialism in the profession.

## Professional

The laity look upon the practice of dentistry and the practice of medicine largely as a matter of trade. They shift from one detail to another, from one position to another, and I sometimes wonder whether

it is the fault of the laity or whether it is the fault of the profession that they do it so much. I think that a large amount of criticism that is brought to bear upon your fellow practitioners and the practitioners of medicine also is due to the fact that we do not treat our patrons in a professional way. If we would follow the Golden Rule, and use each member of the profession as we would like to have him use us; if we would follow every instinct of the true gentleman, one toward the other, we would need no other code of ethics to follow; we would not need a written rule of ethics. Perhaps you may think that I am a little presumptuous to address my remarks along this line, but my relations with the dentists are so friendly and so close that I feel at liberty to talk to you the same as I would to my own fraternity. I am glad to have had this opportunity to meet you, and I extend to you a cordial invitation not only to meet here again next year, but every year hereafter.

President Chompson. you here this morning; we appreciate very much your being here, and in the name of the Society I extend to you the thanks of our organization for giving us your time to come here and deliver this address.

After roll call and other routine business, the President read his address, which appeared in the October issue. On motion the President's address was referred to a committee.

Chairman Gelston appointed the following members on the Com-



mittee on President's Annual Address: Dr. Hopkins, Chairman; Dr. Halsey, Dr. Albray, Dr. Tuttle (Chas. P.), Dr. Dilts.

President Thompson resumed the chair.

Under the head of Miscellaneous Business, I

President Chompson. will appoint the following Committees on Resolutions on the deaths of the following members that have occurred during the last year:

Committee on Dr. Charles S. Stockton: Drs. Sutphen, Watkins and G. M. Holden.

Committee on Dr. Henry A. Hull: Drs. Iredell, Hindell and Truax. Committee on Dr. Edwin Chew: Drs. Malsey, Jewett and S. G. Wallace.

Committee on Dr. Wm. P. Richards: Drs. Brinkman, Watkins and Sutphen.

Committee on Dr. Norman W. Kingsley: Drs. Ottolengui, J. S. Curtis and Hawke.

Committee on Dr. Lewis S. Marsh: Drs. Frost, Woolsey and Adelberg.

On motion, the convention adjourned until 8 o'clock P.M.

#### Evening Session.

President Chompson. Evening as the first number of the session, although not noted on our program, a paper and exhibition by Dr. V. E. Mitchell, of New York, assisted by one of his patients, Miss L. K., and as piano accompanist, Miss Adelaide Gescheidt. This is a case of very unusual interest which Dr. Mitchell would like to exhibit to the Society.

(Dr. Mitchell's paper appears elsewhere in this issue.)

## Discussion of Dr. Mitchell's Demonstration.

Since there has been no one appointed to discuss **President Thompson.** this interesting paper by Dr. Mitchell, I will throw the discussion open to the Society. If anyone has any questions to ask Dr. Mitchell or would like to discuss the paper, I am sure we would all be glad to hear from anyone who will care to take advantage of this opportunity.

Mr. President, I have had a great deal of experience in this work, not only myself, but while associated with Dr. Kingsley for fifteen years. I have seen a great many demonstrations of this kind throughout the country, but I wish to say that this is the best exhibition that I have ever



seen of an improvement of the voice brought about either by an artificial mechanism or by an operation. I think that Dr. Mitchell is to be congratulated on his results with this young lady, and I think the young lady is to be congratulated on having had Dr. Mitchell to do this work for her. I also think that Dr. Mitchell is to be congratulated in having this kind of a patient to work upon. I remember on one occasion Dr. Kingsley took a great deal of pains with a boy whom he was very anxious to benefit, and he could not understand why there was no benefit, until some years afterwards he discovered that the boy was wearing the appliance in his vest pocket. Really, a great deal does depend upon the patient. I think that the doctor has brought to us a very interesting case, but I hope that he would not expect to get as good results in all other cases, because he will not. There are puzzling features about the mechanical treatment of these cases which make it almost impossible to lay down a binding rule. Two appliances may be made for the same person which will look almost exactly alike; one may produce perfect tone, while the duplicate will be so unsatisfactory that the patient would not use it at all. Some slight difference, so far as the appliance is concerned, makes a great difference in the result. I believe that the mechanical reproduction of the roof itself is largely a matter of guesswork, and success depends on experience or good luck. I touch on this because I think that the majority of the dentists do not understand how important it is to realize that in a case like Miss K.'s the palate is not only defective in the soft parts, but in the anterior part also, the hard palate. person is talking practically without a roof. When it comes to a decision on the part of the operator to determine just how high or how low the roof should be, much judgment is needed. If we could determine just what would be normal, just where the palate would have grown if it had grown at all, this part of the problem would be simplified. many cases in duplicating an appliance there is a difference in result, and the patient feels that the second appliance is not satisfactory, whereas you had succeeded with the first. That is so true that last year when I was called upon to duplicate an instrument for a lady made by Dr. Kingsley thirty-seven years ago, and worn by her continuously for thirtyseven years, I decided to take my impression with her appliance in the mouth, so as to reproduce the exact vault and form of the roof to which she had grown accustomed.

Mr. President, I think it would be a mistake to let so interesting a subject pass without further discussion. I had the pleasure of hearing Dr. Mitchell's patient at the meeting of the Oral Surgery Section of the First District this winter, at which the demonstration was even much better



than what you have heard to-night. I suppose the large audience has made the young lady nervous. I certainly agree with Dr. Ottolengui that the patient presents the best results of any that I have seen where this method has been employed. I agree with Dr. Mitchell that the case is one which is unusual. He certainly is to be congratulated on the restoration of speech to the extent of which he has succeeded in this case, a serious one. We should not, however, expect to obtain the same results in all cases. Whereas most of my work has been along the operative line, I will say that any case which I have ever seen where the operation performed has resulted in much benefit derived as far as restoration of speech is concerned has been among infants or children before they were three years old, and in a majority of these cases speech is restored. But it is almost limited to that, and I am very happy to note that you can promise to these unfortunates such a device as Dr. Mitchell has demonstrated this evening.

Mr. President, I would like to express my appreciation more from a musical standpoint than a dental standpoint. I have been interested in musical and in the cultivation of the voice, and until last year I played a church organ. I was particularly impressed by the fine musical art expressed in this lady's voice—the fine tone production, and I wish to congratulate Dr. Mitchell also.

Mr. President, I wish to say another word in allusion to a remark made by one of the speakers Dr. Ottolengui. who I believe said, referring to an operation, that if the patient is operated on early enough in life success may be promised. I hope the gentleman will pardon my differing with him. I do not believe that the surgeon can be any more certain in his promises than the man who makes mechanical contrivances. I know, by personal experience, that at least one prominent surgeon has given up operating in this line entirely, because of the unfortunate consequences that have resulted, leaving patients worse off, from a physical standpoint, than before operation—and worse off for the purpose of possibly placing an adequate instrument. In regard to making promises, I would again say, with all due recognition of the success that Dr. Mitchell has made with this apparatus and with patient, he must not be disappointed if he meets with less success in other cases. Whilst it may be, also, that this artificial vomer which he has supplied to this patient may have served some good purpose in this particular instance, I must confess that I am skeptical as to his theory that it is a needed adjunct to an artificial palate, however reasonable his argument may seem. I also doubt the necessity of hinging the posterior part of the bulb. I am thus skeptical because I have seen,



both in my own practice and more frequently in that of Dr. Kingsley, equally good results in the improvement of speech and correction of nasa! resonance, with a rigid bulb and without any attempt to replace the vomer. I should be very happy to exhibit one such patient to Dr. Mitchell at any time.

Dr. Mitchell. resonance, as we have in this case, without hard rubber. This is made of hard rubber, and I believe fully in the necessity of durability and that the mechanism should be hygienic. Soft rubber will in time become troublesome, and my object is to get away from that entirely. I use nothing but hard rubber to restore those portions that are missing.

Dr. Ottolengul. will offer to exhibit to him another patient who has been wearing a soft rubber velum obturator without renewal for over six years, and I think he will be obliged to admit that the apparatus is both effective and hygienic. Curiously enough, the patient of whom I am speaking is a teacher of music living in this State.

Dr. Mitchell. It is very seldom that we have a patient that is so willing as this patient is to appear before a body of men such as are here. She has put aside all personal feelings in the matter and does it for the sake of science. We appreciate that very much. Sometimes we have a splendid case that we would like to present publicly, but the patient is not willing to appear. There is another thing to be considered, of course, that the appliance itself only makes these things possible with the co-operation and persistance of the patient, without which we cannot expect such a result. It depends greatly upon the patient. We only present this case so as to show what is possible and let you judge whether there is a real benefit or not, and let you decide just as you think.

Mr. President, I move that a vote of thanks be extended to Miss K., the patient, and Miss Adelaide Gescheidt, the accompanist, for favoring us with their presence and co-operation at this meeting.

The motion was seconded and carried.

Next on the program is an essay by Dr. W. G.

President Thompson. Ebersole, Cleveland. Subject: "The Human Mouth in Its Relation to Preventive Medicine and Public



Health." I regret to say that Dr. Ebersole, on account of illness, cannot be present to-night, and the paper will be read by one of our members. Dr. Barry, the Chairman of the Essay Committee, will make a statement and read a letter from Dr. Ebersole.

I will make a brief explanation of the absence of Dr. Ebersole. We had his promise to come here and read this paper. Very recently I received a letter from him to the effect that on account of illness he would not be able to be present. When we received this letter we thought possibly we might receive Dr. Ebersole's material for this lecture, and I telegraphed to Dr. Ebersole and asked him if he would not kindly send us his material, so that we could have some other member read the paper, and in answer to that he has consented.

The committee has asked Dr. Slade, of Millville, to read Dr. Ebersole's paper. Dr. Arthur R. Slade, of Millville, here read Dr. Ebersole's paper. (Paper not for publication.)

President Chompson. I am sure we have all listened with a great deal of pleasure to this very excellent paper by Dr. Ebersole, which should bring out a great many points of value in discussion. I will ask Dr. Thaddeus P. Hyatt, of New York, to open the discussion on this paper.

#### Discussion of Dr. Ebersole's Paper.

Mr. President, members and friends of the Dr. Chadeus P. Hyatt, New Jersey State Dental Society:

Brooklyn. It gives me great pleasure to be with you this evening, and to have the opportunity of speaking upon this subject. It is the subject nearest my heart, because I believe that in this oral hygiene campaign, in which we are teaching the public the value of mouth hygiene, we are doing for our profession the greatest good that possibly can be done, and, at the same time, conferring upon mankind a great blessing.

As the public learn to realize and appreciate the value and importance of mouth hygiene they will learn to better appreciate the services of dentists.

As the public, and public officials, educators and intellectual men and women become better acquainted with the value and importance of the condition of the mouth, in its relation to health and disease, the greater honor and appreciation will be shown our profession. The more honor a man may win in some profession, the larger the number of the better or more intelligent class of men that will be attracted toward that

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profession. After all is said and done, men desire honor more than money, and our profession will receive greater honor the more it becomes known and realized how important our services are. And the oral hygiene campaign is what will teach the people the importance of caring for their mouths.

The vocation of teaching others, of imparting knowledge that others may use, is the highest vocation, and to the extent that we do this do we live up to our title—"doctors"—for a doctor is one who teaches.

And how very important is this subject, that the most of us should feel perfectly competent to teach. How potent and far-reaching in its influence through the reflex action of dental nerve irritation. Many obscure diseases owe their origin to this cause—temporary blindness. deafness, paralysis, insanity, insomnia, melancholia, have many times been traced to decayed teeth, and upon these receiving proper attention all traces of the afflictions have disappeared.

And when we realize that in many cases there is no local sensation of pain, making the correct diagnosis of the case more obscure and difficult, how important is it then for us to impress upon everyone the necessity of keeping the mouth in perfect condition.

We know that the healthy life of the whole body depends upon the nutrition it absorbs, and that, in unclean mouths, with decayed teeth, any and all food becomes poisoned and filthy, and unfit to be swallowed. We know this to be true—then, in Heaven's name, have we the moral right to sit still and tell no one? Is it not our duty as men, and as members of a noble profession, to do all in our power to support and encourage this work?

The campaign of mouth hygiene is interesting laymen, it is interesting men in political positions, it is interesting educators, and all classes of people. It is up to us to realize this, and not only to co-operate, but to be the leaders in this campaign.

As proof of this, let me tell you that, in August next, there is to be held in Buffalo, N. Y., the fourth Convention of the International Congress on School Hygiene. Delegates from every civilized country of the world will be there. You can readily appreciate at once the type and standing of the people who will attend this congress. This convention is to consider anything and everything that will tend to preserve, conserve and protect the physical welfare of the children of the world—just think what that means—it means that mankind is taking active steps to live up to the old motto of thousands of years ago. A sound mind needs a sound body.

Through the efforts of Dr. Ebersole, an entire evening will be given



to the consideration of dentistry in its different aspects, in relation to the welfare of the child.

This would not have been done had not Dr. Ebersole worked very hard to secure this recognition. Do not think we can receive, or will receive any recognition unless we work for it.

Our work is important, but we must first show that we realize this, and that we appreciate its value to the welfare of all. And, believe me, my friends, there is plenty of work to do to teach many of our members how true this is.

I was disappointed upon reading the list of officers and Hon. Vice-Presidents of the International School Hygiene Association to find that the name of no dentist appeared. I wrote to Dr. T. A. Storey, Secretary-General of the Association commenting upon this fact, particularly when the subject of mouth hygiene is of such importance.

Dr. Storey's reply is interesting—I am sorry I did not bring it with me this evening. But the sum and substance of it was this: Dr. Storey was glad I had called his attention to the matter; it was entirely unintentional on their part, but nobody had suggested it before; he hoped there would be many dentists at the forthcoming convention, and it would give everyone great pleasure to give them ample recognition. So you see, my friends, we must assert ourselves. We cannot sit idly by the wayside, and expect to be picked up and carried into the front ranks. I remember a line from a poem I read many years ago, and it seems appropriate at the present:

"God will not help the little chicken which does not try to help itself"

I spoke to you a few minutes ago upon the mental, physical and moral improvement of children under proper treatment of the mouth, and by the practice of mouth hygiene. I wish to refer more particularly to the moral aspect of this question.

Most interesting to me in the reports given from Germany, in connection with the dental work done in the public schools, was this point: It had been observed that those children who had been troublesome, disobedient and unruly, after having their mouths put into good condition, were no longer rude or troublesome or disobedient, and that they took a greater interest in their work, and in their association with their comrades and teachers.

In several of the cases reported by Dr. Upson, of Cleveland, this moral influence is particularly noticeable. In one case a boy, who had until this time been a normal child, healthy, of good disposition and conduct, suddenly developed the practice of thieving and lying. This naturally caused not only sorrow, but anxiety on the part of his parents,



as well as his teachers. The boy was taken to several physicians, and finally was recommended to Dr. Upson. Fortunately for the boy, and for the boy's parents, Dr. Upson has for the last four or five years been particularly interested in the study of dental lesions and their influences on other diseases and conditions. The doctor had several radiographs made of the boy, and found one or two impacted molars. Upon their removal the boy became perfectly normal. The desire for stealing and lying passed away. A very interesting feature in this case lies in the fact that the boy was not conscious of any pain in the dental region; yet we appreciate that the irritation set up by these impacted molars on the periphery of the dental nerve was reflected in some way which none of us understand as vet, and caused an irrational mental condition. While suffering in this condition, the manifestations dealt with questions of moral conduct. Can you not picture to yourself the possibility had this boy not received this attention? This irritation would have continued, the boy would have been punished for wrong-doing; within his own breast he would have had an undefined, yet a very real feeling of injustice; he would have become worse, imprisonment in all likelihood would have followed and here we would find the birth of a criminal. We are members of a profession that, as I have said before, is more honorable than any other profession, in that we are called upon to improve those conditions that are the causes of almost ninety-five per cent. of the diseases of the human body. When we realize all of the different ailments that arise from malnutrition, when we realize all of the different ailments that can be brought about by reflex dental nerve irritation, can you not see that as soon as the public in general are awakened to a realization of these facts, and means are procured and provided whereby the cause of all these ailments can be checked, and then opens up a new era, a grander and larger possibility for the higher development of man in all that proclaims him man; and, therefore, that profession that deals with a cause so potential in its influence on the mental, physical and moral welfare of mankind, must, of necessity, rank higher than any other work that man can do.

I cannot understand how any of us should not be enthused upon the realization of these ideas, and you, my friends of the New Jersey State Dental Society, I congratulate on the steps that you have undertaken in the forwarding of this work. I congratulate you on the achievement that you have attained in Newark, and in other cities of your State in arousing an interest in this question, and providing the means whereby the children can receive proper attention.

President Thompson. I am sure we have all enjoyed Dr. Hyatt's discussion of this paper. Before calling a further discussion on this topic I would like to corroborate



personally one point Dr. Hyatt made in his discussion. I received from the Buffalo School Hygienic Association, not as a dentist, but as President of the Board of Education of Asbury Park, a notification to attend their meeting on the 15th of August in Buffalo. With that notification I was presented with a list of the various officers and vice-presidents and members of the various committees, and in looking over it I noticed with very considerable resentment that there were not any dentists in the list, and in refusing to attend I mentioned to the City Superintendent of Schools, Dr. Sheppard, that I felt that the dental profession had been slighted, and that while I should attend as a member of the Board of Education, I would refuse to go as a dentist. He wrote to the gentleman you spoke about and referred to my criticism, and I have a letter embodying the ideas contained in Dr. Hyatt's communication, or very similar, and I refer to this to corroborate this point in his address. I will now call upon Dr. P. B. McCullough for a further discussion of the paper by Dr. W. J. Ebersole.

Mr. President, the essayist and the gentleman Dr. P. B. McCullough, who has just preceded me in the discussion have so well described the direful consequences that result from the neglect of the teeth that there is not much left for me to say, unless it be to treat of a remedy for this condition.

The Marion School experiment referred to by the essayist presents several interesting points for discussion. In this connection I am reminded of a food clinic being conducted by Dr. Walter W. Roach, one of the Supervisors of School Medical Inspection in Philadelphia. attempt to prove the value of school feeding has produced results most gratifying, and, strange to say, the figures bear a striking resemblance to those given by the essayist. I do not mean that this shall detract from the value of the Marion School experiment, but it goes to show that a child's mental state cannot be improved to the remarkable extent stated in the figures given by the essayist unless the child has been adequately nourished. This goes to prove that it is as important that the child be given enough to eat as that its mouth be properly cared for. The combination of the two things will contribute materially to an increase of efficiency. Just as soon as the cry of Socialism will have passed I think the State will find that as a purely economic proposition it will be worth while to properly feed children as well as to take care of the teeth, the latter of which the city of Philadelphia is now doing.

To such as are opposed on principle to State paternity, I have to say that virtue in its application consists in knowing where to stop. I think the care of the teeth by the State should be limited to pupils in the elementary schools. It so happens that in Pennsylvania the law pro-



vides for compulsory education up to the end of the elementary school age. It is during this period in life that mankind is most susceptible to dental caries, and this is the time in life, compared to all other periods, when dental service is of greatest value. In Pennsylvania it costs the State \$35 a year to educate a child. Every time that a child misses a grade it adds an additional cost of \$35 a year on that particular child's The fact that so many of these children are below grade, because of physical defects, makes the sum of money involved so great that I venture to say that the school officials will discover it to be an economic measure to feed these children as well as care for their teeth. The oral hygiene campaign in Philadelphia has been conspicuously brief in the lecture phase of the propaganda, because we are convinced that the only positive remedy is the dental operation. In an examination of about four thousand school children it was found that in about seventy-five per cent. of that number the fissures in the first permanent molars and frequently in the bicuspids were imperfectly formed at the time of eruption —that calcification was not complete—that consequently these teeth began to decay at once, and that the brush is useless in preventing something that has already occurred. Another point worth observing is that in this special examination of four thousand children referred to it was discovered that in children whose teeth were sound and who did not use the tooth brush that the teeth were clean, and in the children whose teeth were decayed and who did use the tooth brush that the teeth were unclean. The explanation lies in the fact that the children whose teeth were free from decay were able to chew with them, and thereby kept them clean by the friction produced in mastication, while in the case where decay was present they could not use their teeth to chew with and the tooth brush alone was not sufficient to keep the remaining good teeth clean. It will be observed that most patients from twenty-five years of age on present for the renewal of fillings that have failed, or the treatment of diseases that result from any of a number of causes, so that it is not in the treatment of new cavities that the dentist is engaged, but chiefly in renewal work. It is at this period that crown and bridgework and artificial teeth are placed, made necessary at this time in life because these patients have not had proper care during the elementary school age.

President Chompson.

Dr. Ottolenqui.

I will ask one other gentleman to say a few words on this paper. I will call on Dr. Ottolengui.

Mr. President, I am not going to dispute anything the last speaker has said, nor anything that Dr. Hyatt has said, except to point out that, accord-

ing to my mind, there is another very important side to this question which has not been touched upon. To recapitulate: Dr. Hyatt points to the



importance of awakening the conscience of the public to the necessity of mouth hygiene—to the advantages of mouth hygiene. The next speaker pointed out that mouth hygiene simply is a dogmatic theory and that lecturing will not accomplish very much in stopping disease, and he advises that in this preventive campaign we do something instead of just talking, and the thing he tells us must be done is to fill the teeth. It seems to me that the first proposition is true enough, and it is also true that the teeth need filling in spite of the efforts that is made to prevent them from decaying. Whilst I do not agree at all with this dogma which is on all clinic room walls. that "a clean tooth never decays." I do believe that the cleaning of the teeth minimizes the amount of decay that occurs in the mouth and consequently this is, after all, the important aspect of this question. Let me tell vou why: It is all very well to say, as Dr McCullough did, that certain decay comes from defective tooth formation in spite of cleaning. Thank the Lord, it is a very small proportion of the teeth which we fill that are decayed from these causes. But it is these very teeth that are likely to decay if they are left unclean. Let us suppose for a moment that there are a very large number of teeth. doomed to decay, and that the only remedy is the filling of them. Just as a brush would not stop this decay the filling would not stop it unless the child is brought to you in time to check it, and unless the child is made cognizant that he needs to have his teeth filled. Rest assured that if this campaign succeeds it must depend on the compulsory examination and cleansing of the teeth of every child in every public school at least once in every thirty days, and that cannot be done by the dental profession. We have not diploma mills enough to grind out men in numbers large enough to carry on a campaign of that kind. Take all the children in the one City of New York, and if all the graduates of all the colleges in the United States were set at work on them they could not catch up with caries in five years. When the cry goes out that we must have more dental attendants, I wish to be heard by those who preach the reverse, and to say that we are not trying to bring about a new cheap kind of dentist: but we are praying for the day when properly trained and thoroughly capable women will devote themselves to the prophylactic care of the mouths of school children.



In the October issue we published a criticism by Dr. C. Edmund Kells, in which occurs the following statement: "In passing, it might be well to dissent from the essayist (Dr. J. Lowe Young) upon pure gold being the best for the extensive restorations of which he speaks. Cast pure gold is not as dense as malleted gold, therefore a harder alloy is frequently preferable for extensive restorations and crowns."

In this view Dr. Kells enjoys distinguished companionship, since very many of our best operators advocate an alloy of platinum in gold in order to obtain a higher specific gravity and greater hardness in inlays. On the reverse side of the argument we find Dr. Taggart declaring for pure gold, as being quite sufficiently dense, as well as hard enough, while casting with greater accuracy.

Dr. Kells tells us that cast gold is not as dense as hammered gold. This statement, taken literally, is quite true, when the hammering is well done, but is an insufficient argument against pure gold for cast inlays.

In Prof. G. V. Black's Operative Dentistry (pages 232 to 237) will be found a discussion of this question of density in gold fillings. He reports the specific gravity of cast gold to be from 19.20 to 19.25, and says



"The greatest density obtained by hammering gold in the ordinary way without lateral support to prevent spreading was 19.3." A higher specific gravity, however, was obtained by malleting gold into a steel matrix having four surrounding walls. He lists seven experimental test fillings made with various combinations of gold and mallet force, the reading being as follows: 19.38—19.42—19.18—18.61—17.4—18.0—and 18.3.

Of these the distinguished author says: "The first four fillings in this table are, of course, purely experimental fillings, made to show what can be done with gold foil as compared with cast, hammered and annealed gold, as shown in the previous table. The endeavor was to make the last six as fillings may be made in the mouth."

Thus we learn that all the tests made in conformity with mouth conditions showed a specific gravity below that of cast gold, except three, made with platinum and gold foil, the specific gravity of which, however, was not given, probably because at the moment the discussion was on gold. The author has also explained that in making these test fillings the matrix slab was sometimes resting on the table, in which case a greater density could be obtained, for which reason tests were also made with the slab resting on a cushion, as this would more nearly resemble the conditions present when filling a tooth set in the spongy bone of the jaw.

An analysis of these tests shows that the high specific gravity of malleted foil fillings was obtained in steel matrices having surrounding walls and with the slab on the table. The author himself intimates that in actual mouth work the conditions are quite different, as the spongy bone of the process would offer less resistance to the impact of the mallet. He tells us that the specific gravity of hammered gold when not restrained against lateral spreading is 19.3, only a trifle higher than cast gold. It therefore follows that while in exceptional instances a filling may be hammered into a human tooth, having sound surrounding walls, in such a way as to obtain a specific gravity as high as that of cast gold, it would be highly improbable that any such density could be obtained in making a contour filling involving one or more of the tooth walls.

But there are still other factors which have in the past and will in the future influence the density of hammered gold fillings. The human tooth is quite different from a steel matrix on a table. In the latter, uniform blows may be struck throughout the operation. In the mouth,



the longer the operation the more likely that the patient would begin to flinch and the operator to lighten the blow. For this reason many fillings have had less density at the surface than elsewhere. Then we have naurasthenic, and sensitive women and children to deal with, and we must ever remember to "temper the winds to the shorn lamb." Indeed, Dr. Black himself says "it has been found that those (fillings) made for children are of less specific gravity than those made for adults." Yet a high specific gravity if needful in any filling should be present in the tooth of the young, which have so much longer probable service ahead. At least, it cannot be said of inlays that those made for children are inferior in density to those made for adults.

After making tests himself, Dr. Black invited others to make specimen fillings for him, and in the *Dental Cosmos* for 1895 (pages 746-750) will be found a report of filling made by dentists in Chicago and St. Paul. It will be well for the sake of this argument to give here the specific gravity of these as reported by Dr. Black. The fillings varied in density as follows: 17.4—18.0—18.3—16.6—15.8—17.3—14.6—14.6—15.8—14.6
15.7—14.7—17.6—18.9—18.4—16.4—16.8—18.7—18.2—17.0—12.0—12.5
14.0—16.9—17.4—14.9—15.4—17.3—12.7—15.1—13.2—10.7—12.7—14.8
14.7—17.6—10.7—18.9.

Here we have the record of thirty-eight fillings, all made for the purpose of testing methods, and consequently made carefully by good operators trying to make the best possible shows of their work, and what do we find? Not a single specimen attained a density equal to cast gold.

Surely the test fillings made by these men represent average results with foil fillings. Indeed, it is almost certain that the work of these men seen in the mouths of their patients would be counted as above the average. Yet none made fillings as dense as castings, whereas to-day every one of them can easily and surely make cast inlays with a specific gravity of 19.2 and higher.

Further Reports on Density of Gold Fillings. In the *Dental Cosmos* for 1896 (pages 304 and 307) may be found further records. The first table (page 304) shows the records of test fillings made by such well-known operators as Northrop, Van Woert, Jarvie, Littig, Darby, Perry, McQuillen, and



others. The densities obtained were as follows: 16.26—17.22—16.02—16.82 — 16.23—17.22—18.00—17.30—12.53—13.83—13.21—17.19—17.47 18.36 — 16.54—17.41—17.34—17.10—17.94—18.74—18.05—17.76—18.47 18.05—17.76—18.47—16.10—16.79—16.48—15.94—17.25—17.87. Here we have twenty-nine test fillings made by skilled operators, and the nearest approach to the specific gravity of cast gold (19.2) was 18.74, made by Dr. Safford G. Perry. Many fell far below the density of cast gold. Where, then, is the vitality of an argument that tells us that the fillings of the past have served us well, and yet that we must now discard pure gold for an alloyed gold when making inlays because "hammered gold is more dense than cast gold"? When has gold hammered in human teeth ever been proven to have a density higher than 19.2, which is easily obtained with cast inlays?

But there is still a better record. Dr. Black, with his usual thoroughness, admitting that all these fillings out of the mouth made in test conditions, and in restraining steel matrices, might not fairly tell the story of work done in the mouth, collected specimens of fillings which had proven successful in the mouth, but which had been removed for some sufficient cause. It was, of course difficult to obtain many such specimens with authentic histories, but he reports twelve, as follows: 17.10—15.60—16.40—17.60—14.83—15.21—16.12—14.98—16.0—16.25—15.20—16.20—figures which closely resemble those made in the test conditions. Yet these fillings were made by Dr. Black himself, C. N. Johnson, J. N. Crouse, and other good men.

Thus we have not yet discovered the authentic proof of the statement that a hammered foil filling has a specific gravity higher than that of cast gold. Hence that argument falls.

It must be admitted that a higher specific gravity is attainable when using platinum-gold foil, but the percentage of men who have used that method of filling teeth is so infinitesimally small as to be negligible in any argument which first declares that the average fillings of the past have served us well enough, and then adds that pure gold is not dense enough for making inlays. I am not attributing this argument in just this form to Dr. Kells. But this editorial is not addressed solely to him, but rather to all those men of prominence who make dogmatic statements, based upon purely empirical notions, and without any scientific evidence whatever presented in support of their views.

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## The Object of the Argument.

The writer does not wish to be understood as saying that pure gold is as good or better than an alloyed gold for filling teeth. He is merely pointing out that men are rashly stating as facts what has

never been proven, neither by themselves nor by other men. Let me just point out how mistaken ideas may thus arise. Some discriminating operator deciding that in certain conditions, as, for example, in a mouth where the existing attrition of masticating surfaces shows that the stress of mastication exhibited by that definite individual is above normal, a high surface hardness is desirable, obtains it, or thinks he attains it, by alloying pure gold with platinum to the extent of three or five per cent. He reports this and adds casually, "You know hammered gold is more dense than cast gold." This last statement is true, but is in no way correlated with his use of an alloy for his cast inlay, nor with methods of filling teeth in general. The hearer concludes that the speaker has clinically demonstrated that a cast gold inlay is inferior to a hammered foil filling, and that consequently he must alloy his gold for casting.

In some such manner the notion that pure gold cast inlays are less dense than hammered foil fillings has been quite widely disseminated, and yet there is not a scintilia of clinical nor any other recorded evidence to substantiate it.

Once more the writer desires to say that he is expressing absolutely no opinion as to the relative value of pure or alloyed gold for making inlays. He withholds an opinion awaiting the evidence. He can see many sides to the question and advantages and objections in both, which should be carefully tested, recorded and comprehended so that the judicious dentist may make intelligent choice.

It would indeed be a boon if someone would investigate this as Prof. Black did the gold foil question, and give us authoritative, scentifically obtained data.

If Taggart's claim be true that pure gold can be more accurately cast than an alloy, then all the arguments for alloys must fall, because specific gravity and hardness are not the only desirable qualities in a tooth filling. Perhaps adaptation to the cavity walls is even of more consequence, since the closer the fit the less the cement and the better the margins.

It is the writer's belief, held tentatively, that the specific gravity of



pure gold when cast is quite high enough, and that even though cast pure gold can be further compressed under stress, this dangerous characteristic will not be exhibited in large gold inlays, provided the occlusal surfaces be formed in copy of nature and the occlusion be neither too high nor too low. He has seen such inlays after five years of service in the mouth standing up without a blemish on the surface, whereas gold foil fillings in adjacent teeth were rough and pitted. Nevertheless, it may be that in certain situations and under definite conditions of stress and environment an alloyed gold would be preferable. But let us not determine this upon the dogmatic allegation of any man. Let us investigate and obtain proof, and then base our practice upon known facts.





# SOCIETY ANNOUNCEMENTS

# Mational Dental Association Advances Date of 1914 Meeting One Week.

At the urgent request of the Local Committee of Arrangements at Rochester, the Trustees of the National Dental Association have advanced the date of the next meeting one week; therefore, the Eighteenth Annual Session will be held in Rochester, N. Y., July 7, 8, 9, 10, instead of July 14, 15, 16, 17, as originally selected. The officers, the local committee and all other committees are going to put forth every effort to make this meeting, which is the first under the reorganization, the best in the history of the association, and we feel confident that our increased membership and interest in our association will prove a decided advantage in many ways.

Отто U. King, Gen. Sec'y, Huntington, Ind.

Homer C. Brown, President, Columbus, Ohio.

# Back Copies of the Proceedings of the National Dental Association.

There are a few copies of the '07, '08, '09, '10 and '11, "Transactions of the National Dental Association" in the possession of Dr. Arthur Melendy. These copies, while they last, may be secured by libraries and



other educational institutions and members of the N. D. A. by sending thirty cents per copy (to cover postage) to Dr. Arthur R. Melendy, Holston Bank Bldg., Knoxville, Tenn.

Otto U. King, General Secretary.

Huntington, Ind.

Institute of Dental Pedagogics.

The next annual meeting of the Institute of Dental Pedagogics will be held in Buffalo, N. Y., January 27, 28, 29, 1914. The Executive Committee is planning to present an exceptionally interesting program, which no dental teacher can afford to miss.

J. F. BIDDLE, Secretary.

Pittsburgh, Pa.

## Ohio State Dental Society.

The forty-eighth annual meeting of the Ohio State Dental Society will be held in Memorial Hall, Toledo, Dec. 2, 3, 4, 1913.

The program of papers contains the names of men of world-wide reputation.

The progressive clinic plan will be followed; twenty clinics by men selected from over the country for their especial fitness for the subject demonstrated will make this an educational feature of unexcelled importance.

A "Health and Science" conference on Wednesday evening carries the names of the Governor of the State, the President of the N. D. A. and of the A. M. A., Dr. Flexner, of the Rockefeller Institute; Dr. Mc-Campbell, Secretary of the State Board of Health, and Dr. E. C. Kirk, editor of the *Cosmos*.

Make your arrangements to attend the best and biggest meeting of this society ever held.

F. R. CHAPMAN, Secretary.

305 Schultz Bldg., Columbus, Ohio.

## Virginia State Board of Dental Examiners.

The next meeting of the Virginia State Board of Dental Examiners for the examination of applicants will be held in Richmond, Va., November 17, 1918, 9 A.M.

For further particulars address

Dr. J. P. Stiff, Secretary.

Fredericksburg, Va.



# Union Meeting of the Fifth, Sixth, Seventh and Eighth District Dental Societies of the State of New York.

Union Meeting of the Fifth, Sixth, Seventh and Eighth District Dental Societies of the State of New York will be held in Elmira, N. Y., Thursday, Friday and Saturday, November 20, 21 and 22, 1913. This is the only large meeting in these districts this fall, and a large attendance is hoped for. If out of the district and interested, write Dr. John D. Ogden, Binghamton, N. Y., who will mail you a program.

## new Jersey Board of Examiners.

The New Jersey State Board of Dental Examiners will hold their regular annual meeting and examination in the Assembly Chamber of the State House at Trenton, N. J., December 1, 2 and 3, 1913.

After January 1, 1914, all applicants for a license to practice dentistry in New Jersey "shall present to said board a certificate from the Superintendent of Public Instruction showing that before entering a dental college he or she has obtained an academic education consisting of a four-years' course of study in an approved high school (public or private), or the equivalent thereof." A bridge, consisting of three or more teeth, exclusive of abutments, and one Richmond Crown, will be accepted as a practical test in prosthetic dentistry, in place of a full set of teeth soldered upon a gold or coin silver plate as hitherto required.

Applications must be filed at least ten days prior to date set for examination. For further particulars apply to

ALPHONSO IRWIN, D.D.S., Secretary.

425 Cooper Street, Camden, N. J.

## Hrizona Board of Dental Examiners.

The Arizona Board of Dental Examiners will meet at Phœnix, beginning November 10, 1913.

Prospective candidates for examination should apply at once to Sidney P. Osborn, Secretary of State of Arizona, at Phœnix, Arizona, for an application blank, and return same to him, properly filled out, together with fee of twenty-five (\$25) dollars.

The Board also wishes to announce that the next meeting of the Board after the November, 1913, meeting, will probably not be before October, 1914.

As no temporary licenses are granted, it is desirable that all who contemplate applying for a license in Arizona in the near future should avail themselves of the next meeting of the Board.

J. HARVEY BLAIN, Secretary.

Prescott, Arizona.